

# FLORA AND PHYTOGEOGRAPHY OF CUMBRES DE MONTERREY NATIONAL PARK, NUEVO LEON, MEXICO

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## ABSTRACT

A study of flora of the Cumbres de Monterrey National Park (CMNP) was carried out; the area is located in the Sierra Madre Oriental physiographic province. The CMNP's flora is found in arid, temperate, and warm areas. The total flora comprises 137 families, 600 genera, and 1,300 species of vascular plants. The families with the highest number of genera and species respectively are Asteraceae (94–204), Fabaceae (50–120), Poaceae (42–93), Lamiaceae (17–52), Malvaceae (14–25), Brassicaceae (13–26), Rosaceae (12–25), Solanaceae (12–26), and Euphorbiaceae (11–43). The genera with the highest number of species are *Quercus* (24), *Euphorbia* (22), *Salvia* (18), *Ageratina* (12), *Verbesina* (11), *Senecio* (11), and *Verbena* (9). From the total species recorded, 34 (2.5%) are endemic to Nuevo Leon, with most belonging to Asteraceae (9 species) followed by the Fabaceae (5 species). More than 90% of the CMNP flora is autochthonous. The phytogeography of CMNP corresponds mainly to three origins: warm area elements, mainly found in piedmont scrub, dominated by neotropical species; temperate area elements, distributed mainly in mixed forest (oak-pine), dominated by species from cool or cold areas; as well as endemic elements from Mexican arid lands such as Cactaceae and Agavaceae occurring mainly in xerophyllous scrublands in the Park.

**KEY WORDS:** Cumbres de Monterrey National Park, Nuevo Leon, northeastern Mexico, phytogeography, flora

## RESUMEN

Se estudió la flora del Parque Nacional Cumbres de Monterrey (PNCM) situado en la provincia fisiográfica de la Sierra Madre Oriental. El PNCM posee vegetación de zonas áridas, cálidas y templadas. La flora comprende un total de 137 familias, 600 géneros, 1,300 especies y 173 taxa intraespecíficos de plantas vasculares. Las familias con mayor número de géneros y especies respectivamente son Asteraceae (94–204), Fabaceae (50–120), Poaceae (42–93), Lamiaceae (17–52), Malvaceae (14–25), Brassicaceae (13–26), Rosaceae (12–25), Solanaceae (12–26) y Euphorbiaceae (11–43). Los géneros con mayor número de especies *Quercus* (24), *Euphorbia* (22), *Salvia* (18), *Ageratina* (12), *Verbesina* (11), *Senecio* (11) y *Verbena* (9). Del total de especies 34 de ellas (2.5%) son endémicas de Nuevo León, la mayoría pertenecientes a Asteraceae (9 especies), Fabaceae (5) y Pinaceae (2). Más del 90% de la flora del PNCM es autóctona. La fitogeografía del área corresponde principalmente a tres vertientes: elementos de áreas cálidas, se encuentran en matorrales submontanos con especies de origen neotropical; elementos de áreas templadas, se localizan en bosques mixtos de pino-encino con especies de origen netmente de áreas frías o frescas y elementos endémicos de las zonas áridas mexicanas, como el caso de las Cactaceae y Agavaceae presentes en los matorrales xerófilos del Parque.

**PALABRAS CLAVE:** Parque Nacional Cumbres de Monterrey, Nuevo León, noreste de México, fitogeografía, flora



## INTRODUCTION

The northeastern region of Mexico is characterized by climatic and landscape heterogeneity; its extensive plains, high mountains, and scattered hills shelter an intricate and diverse mosaic of vegetation, characterized by rich plant diversity and life forms. The heterogeneous physiography among different regions clearly differentiates distinctive climatic zones, especially evident in the State of Nuevo Leon, where three physiographic provinces are recognized: Gran Llanura de Norteamérica (North American High Plains), Llanura Costera del Golfo Norte (North Coastal Gulf Plain), and Sierra Madre Oriental (INEGI 1986). These have contrasting particularities of soils, vegetation types, and plant diversity. The orthographic, edaphic, and climatic factors of the physiographic provinces show close relationships between the vegetation types, flora, and plant endemism (Epling 1939; Woodson 1954; Barneby 1964; Johnston 1971, 1975; Powell & Turner 1974; Powell 1978; Zanoni & Adams 1979; Nesom 1981; Turner 1994a, 1994b, 1994c, 1996, 1997, 2001; Valdés & Flores 1983, 1986; Anderson 1987; McDonald 1990; Hinton & Hinton 1995; Allred & Valdés-Reyna 1997; Valdés-Reyna 1997; Espejo & López 1997; Henrickson & Johnston 1997; Valiente-Banuet et al. 1998; Estrada 1998; Valdés-Reyna & Allred 2003; Mickel & Smith 2004; Estrada et al. 2007; Balleza & Villaseñor 2011; Velazco-Macías et al. 2011; Estrada et al. 2012).

The vegetation is characterized by 11 plant communities: 1) Tamaulipan thornscrub, 2) piedmont scrub, 3) rosetophyllous scrublands, 4) microphyllous scrubland (Muller 1939; Rojas-Mendoza 1965; Rzedowski 1978; Estrada & Martínez 2003), 5) chaparral (Valiente-Banuet et al. 1998), 6) oak forest, 7) oak-pine forest (Rzedowski 1978; Perry 1991), 8) conifer forest (Miranda & Hernández 1963; Beaman & Andersen 1966; Rzedowski 1978; Perry 1991; Farjon et al. 1997; Graham 1999), 9) halophytic communities (Scott et al. 2004; Estrada et al. 2010), 10) alpine meadow (Beaman & Andersen 1966), and 11) aquatic vegetation (Rzedowski 1978).

The scrublands and forest types are present in the central part of Nuevo Leon and constitute the main landscapes of the Cumbres de Monterrey National Park (CMNP), the largest National Park in Mexico, covering an area of 177,367 ha (1773 km<sup>2</sup>). The CMNP was established in 1939 by a presidential decree to preserve the regional flora and fauna and is one of the most visited areas in Nuevo Leon for activities such as camping, hiking, rappelling, and leisure. Small villages, ranches, private properties, and *ejidos* are widely distributed throughout CMNP; the vibrant economy is based mainly on fruits such as apples, peaches, plums, and apricots. The objective of the present work is to document the plant diversity and the phytogeography of the CMNP.

### Study area

The Cumbres de Monterrey National Park is located in the central-west portion of Nuevo Leon. It includes part of seven municipalities: Allende, Montemorelos, Monterrey, Rayones, Santa Catarina, San Pedro Garza García, and Santiago (25°41'–25°02'N, 100°45'–99°11'W). The altitude ranges from 600 to 3400 m. The main urban areas in CMNP are Puerto Genovevo, El Manzano, Ciénega de González, Laguna de Sánchez, El Tejocote, El Hondable, La Camotera, La Trinidad, Potrero Redondo, El Pajonal, El Huajuco, La Huasteca, and San Antonio de la Osamenta (Fig. 1).

**Geology.**—The most common outcrops are from sedimentary rock and clastic deposits of the Mesozoic Era. Most outcrops in lowlands are constituted by lutites, conglomerates, and limestone. Higher in the Sierra Madre Oriental are Mesozoic limestone and recent deposits of conglomerates and alluvial soils from the Quaternary (INEGI 1986).

**Soil.**—Predominant soils in lowlands are regosols and lithosols, developing into rendzinas and xerosols. Intermountain valleys, as well as low plains, are mainly clay vertisols, frequently with high calcium carbonate contents and poor drainage (INEGI 1986).

**Climate.**—The study areas have a seasonal climatic pattern. There is a dry season from November to May and a humid season from June to October; however, some differences are evident for both the North Coastal Gulf Plain (NCGP) and the Sierra Madre Oriental (SMO) physiographic provinces (García 1973; INEGI 1986). Two main climates are dominant in the NCGP, warm and arid. The type A (C)w (semiwarm-subhumid) cli-



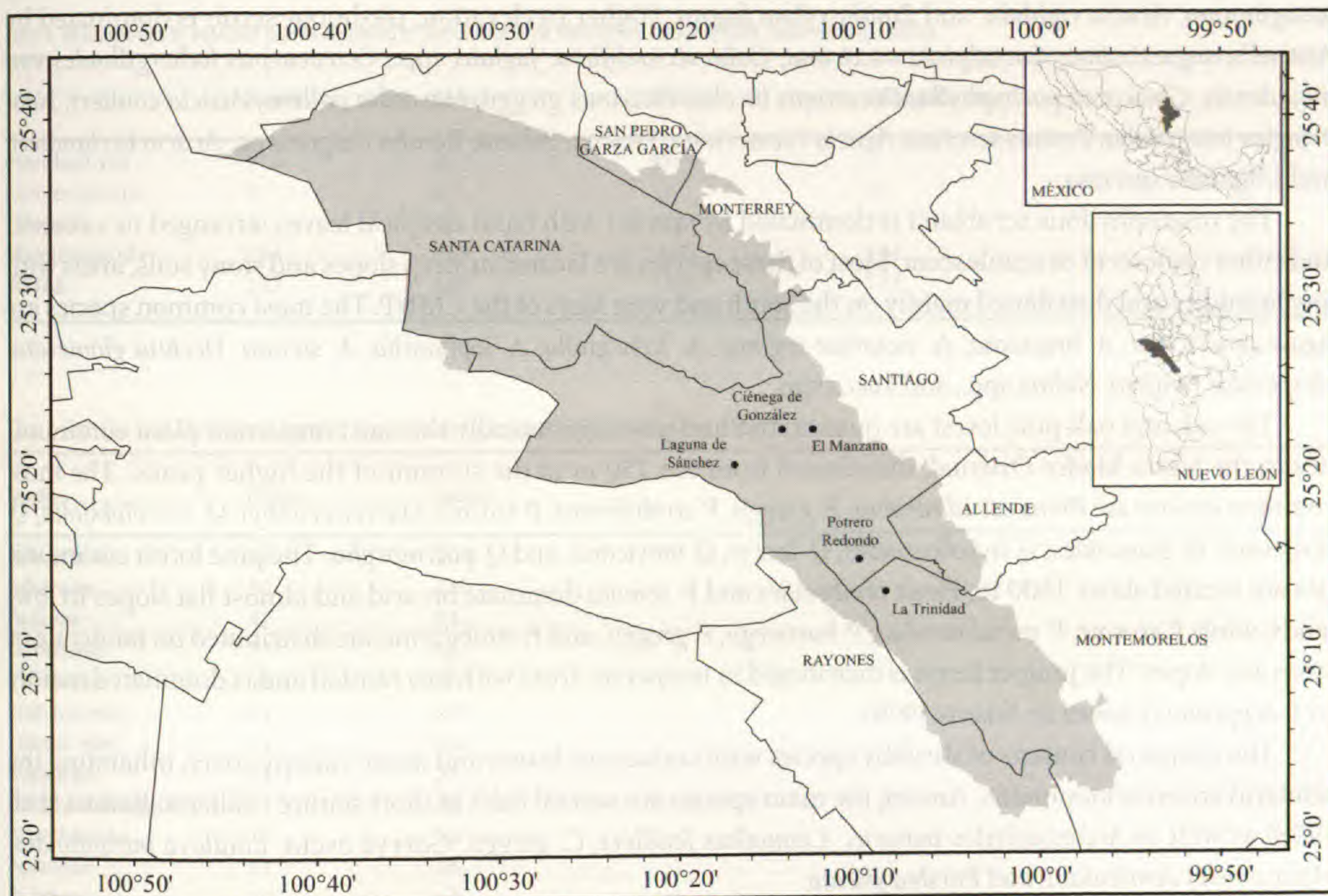


FIG. 1. Study area, municipalities, and main villages in Cumbres de Monterrey National Park, Nuevo Leon, Mexico.

mate, with 18°C as yearly mean temperature and annual rainfall averaging 1000 to 1200 mm, is distributed on the windward slopes of the CMNP. The arid-warm (BS) and arid-semiwarm (Bw) climate types are found on the leeward slopes south and west of the study area, averaging an annual mean temperature higher than 18°C and annual mean rainfall 400 mm (García 1973; INEGI 1986). Both types of climate are found at lower altitudes (400–750 m) where scrublands with different physiognomy, structure, and plant composition are the main plant vegetation. The temperate-subhumid (Cw) climate is common in the mesic and temperate areas above 750 m on windward slopes, averaging 12–18°C mean annual temperature and annual rainfall of 1500 mm. This climate is found in the mountains and slopes over 750 m, where the main plant communities are oak and conifer forest.

**Vegetation.**—The main vegetation types in the CMNP, according to Muller (1939), Rojas-Mendoza (1965), INEGI (1986), and Estrada et al. (2012a), are: Tamaulipan thornscrub, piedmont scrub, microphyllous scrubland, rosetophyllous scrubland, oak forest, oak-pine forest, pine forest, and *Juniperus* forest. The Tamaulipan thornscrub is a plant community dominated by medium (1–2 m) to short (1 m) shrubs, present at lowest altitudes in the CMNP.

The most common elements are: *Agave lecheguilla*, *Bernardia myricifolia*, *Cercidium macrum*, *Cordia boissieri*, *Eysenhardtia texana*, *Havardia pallens*, *Jatropha dioica*, *Karwinskia humboldtiana*, *Leucophyllum frutescens*, *Opuntia engelmannii*, *Schaefferia cuneifolia*, and *Acacia rigidula*.

The piedmont scrub is composed of thorny and non-thorny evergreen or deciduous shrubs, reaching up to 3 m tall, along the lower slopes of the mountains. The most common species are: *Agave lecheguilla*, *Amyris madrensis*, *A. texana*, *Bernardia myricifolia*, *Caesalpinia mexicana*, *Calia secundiflora*, *Celtis pallida*, *Cordia boissieri*, *Eysenhardtia texana*, *Forestiera angustifolia*, *Gochnatia hypoleuca*, *Havardia pallens*, *Helietta parvifolia*, *Jatropha dioica*, *Karwinskia humboldtiana*, *Leucophyllum frutescens*, *Malpighia glabra*, *Neopringlea integrifolia*, *Opuntia engelmannii*, *Randia rhagocarpa*, *Schaefferia cuneifolia*, *Acacia berlandieri*, *Acacia greggii*, *Sideroxylon*



*lanuginosum*, *Acacia rigidula*, and *Zanthoxylum fagara*. Higher in elevation, piedmont scrub is dominated by *Acaciella angustissima*, *Caesalpinia mexicana*, *Calia secundiflora*, *Juglans* spp., *Cercocarpus fothergilloides* var. *mojadensis*, *Chiococca pachyphylla*, *Decatropis bicolor*, *Fraxinus greggii*, *Havardia pallens*, *Acacia coulteri*, *Neopringlea integrifolia*, *Prunus serotina*, *Acacia roemeriana*, *Ptelea trifoliata*, *Randia rhagocarpa*, *Acacia berlandieri*, and *Ungnadia speciosa*.

The rosetophyllous scrubland is dominated by species with basal or apical leaves, arranged in a rosette, and either caulescent or acaulescent. Most of these species are located in steep slopes and stony soils, areas with low humidity and distributed mainly on the south and west faces of the CMNP. The most common species are *Agave americana*, *A. bracteosa*, *A. victoriae-reginae*, *A. lecheguilla*, *A. lophantha*, *A. striata*, *Hechtia glomerata*, *Hesperaloe funifera*, *Nolina* spp., and *Yucca* spp.

The oak and oak-pine forest are quantitative and physiognomically the most important plant communities in the Sierra Madre Oriental, distributed from the 750 m to the summit of the higher peaks. The most common species are *Pinus pseudostrobus*, *P. greggii*, *P. strobiformis*, *P. teocote*, *Quercus canbyi*, *Q. coccolobifolia*, *Q. fusiformis*, *Q. glaucoides*, *Q. hypoleucoides*, *Q. laceyi*, *Q. mexicana*, and *Q. polymorpha*. The pine forest communities are located above 1600 m; *Pinus cembroides* and *P. remota* dominate on arid and almost flat slopes in lowlands; while *P. teocote*, *P. pseudostrobus*, *P. hartwegii*, *P. greggii*, and *P. strobiformis* are distributed on moderate or steep wet slopes. The juniper forest is distributed in temperate areas with low rainfall and is dominated mainly by *J. deppeana* (Zanoni & Adams 1979).

The chaparral consists of shrubby species with coriaceous leaves and dense canopy cover, inhabiting the semiarid areas on mountains. Among the main species are several oaks of short stature (Valiente-Banuet et al. 1998) as well as *Arctostaphylos pungens*, *Ceanothus fendleri*, *C. greggii*, *Garrya ovata*, *Lindleya mespilioides*, *Malacomeles denticulata*, and *Purshia plicata*.

## METHODS

**Field and lab work.**—Field work was carried out from 2005 to 2012, collecting plants in all plant communities present in the CMNP. Plants were identified by authors and specialists for different groups. Plants are housed in the CFNL herbarium, and duplicate sets of plants were sent to different herbaria as exchange (ANSM, BRIT, MEXU, and TEX). Previous floristic studies for Mexico, as well as monographs of most of the genera, were used to determine families and genera origin and distribution. The plant list follows Thorne's (1992 (monocots), 2000 (dicots)) classification system for Angiospermae, but for Scrophulariaceae (in part), we followed Olmstead et al. (2001) and Anthericaceae (Kim et al. 2010). We followed Crabbe et al. (1975) for ferns and allies (Pteridophyta) and Eckenwalder (2009) for Gymnospermae (conifers). The families, genera, and species of each major group are alphabetically arranged in Appendix 1.

## RESULTS

### Diversity

We recorded 137 families, 600 genera, 1300 species, and 173 infraspecific taxa of vascular plants in the CMNP (Table 1, Appendix 1). The families with the highest number of genera and the genera with the highest number of species are shown in Table 2 and Table 3, respectively. Twenty-four of the families (17.6%) include 65% and 66.5% of the genera and species, respectively, while the 13 most diversified genera include 12.23% of the total species. The dicotyledoneae are by far the most common plants in the CMNP, while conifers are the less diversified taxa. The Asteraceae, Poaceae, and Fabaceae families highlight as the most diversified groups of plants, and *Quercus*, *Euphorbia*, *Salvia*, and *Ageratina* stand out as the most diversified genera. These three families and four genera are distributed in all plant communities in the CMNP.

### Endemism, precedence, and growth forms

From the total number of species for the CMNP, 34 of them (2.5%) are endemic (see Appendix 1 (\*)) for the State of Nuevo Leon. Most of the endemic species belong to two families: Asteraceae (9 species) and Fabaceae (5). *Astragalus* is the genus with the highest number of endemic species (3). By far, the native species (1222 =



TABLE 1. Main groups of vascular plants recorded in the Cumbres de Monterrey National Park, Nuevo Leon, Mexico.

	Families	Genera	Species	Intraspecific taxa
Pteridophyta	7	20	45	7
Coniferophyta	5	8	17	8
Liliopsida	21	87	193	16
Magnoliopsida	104	485	1045	142
<b>TOTAL</b>	<b>137</b>	<b>600</b>	<b>1300</b>	<b>173</b>

TABLE 2. Families with the highest number of genera and species in CMNP, Nuevo Leon, Mexico.

Families	Genera	Species
Asteraceae	94	204
Fabaceae	50	120
Poaceae	42	93
Lamiaceae	17	52
Malvaceae	14	25
Brassicaceae	13	26
Solanaceae	12	26
Rosaceae	12	25
Euophorbiaceae	11	43
Acanthaceae	11	18
Apiaceae	11	16
Rubiaceae	10	17
Pteridaceae	10	23
Cactaceae	10	21
Boraginaceae	9	23
Apocynaceae	9	18
Orchidaceae	9	13
Rutaceae	9	11
Sapindaceae	8	9
Verbenaceae	7	28
Cyperaceae	7	15
Nyctaginaceae	6	14
Crassulaceae	5	11
Commelinaceae	4	8

TABLE 3. Genera with the highest number of species in the CMNP, Nuevo Leon, Mexico.

Genera	Number of species
Quercus	24
Euphorbia	22
Salvia	18
Ageratina	12
Verbesina	11
Senecio	10
Desmodium	10
Dalea	10
Verbena	9
Pinus	9
Paspalum	8
Cheilanthes	8
Asclepias	8



94%) dominate over the introduced ones (75 = 6%). Most of species recorded are herbaceous (1040; 80%) and shrubs (169; 13%), followed by trees (78; 6%), and plants with fleshy stems (26; 2%). The epiphytes, parasites, and lianas are rare.

### Phytogeography

The different plant associations found in the CMNP, along with their rich plant species diversity, allow recognition of different distribution patterns of the genera throughout its altitude gradient. Table 4 shows the origin and genera number found by plant community.

The piedmont scrub (PMS) has the highest number of genera from neotropical (130) and warm origin (122). Most of its floristic components are from warmer areas origin, highlighting those shrubs and trees which are important components in this landscape. These include *Acacia*, *Acaciella*, *Buddleja*, *Condalia*, *Cordia*, *Diospyros*, *Esenbeckia*, *Gochnatia*, *Leucaena*, *Persea*, and *Smilax*, as well as frequently abundant herbaceous elements such as *Abutilon*, *Acalypha*, *Begonia*, *Commelina*, *Cyperus*, *Datura*, *Euphorbia*, *Hibiscus*, *Ipomoea*, *Jacobinia*, *Lantana*, *Mentzelia*, *Pavonia*, *Phytolacca*, *Ruellia*, *Sechium*, *Serjania*, *Sida*, *Tagetes*, *Tetramerium*, *Tradescantia*, *Tridax*, *Tripogandra*, *Turnera*, *Verbena*, *Verbesina*, and *Viguiera*. Also, the PMS has the highest typically Mexican genera such as *Ageratina*, *Batesimalva*, *Carlowrightia*, *Chrysactinia*, *Ebenopsis*, *Eustoma*, *Fleischmannia*, *Havardia*, *Hechtia*, *Hesperaloe*, *Jefea*, *Melampodium*, *Mirandea*, *Sanvitalia*, *Seymeria*, *Tagetes*, *Tigridia*, *Vigethia*, and *Zaluzania*. Almost half of the warm Mexican and neotropical origin genera registered in PMS are found also in the rosetophyllous scrublands (RS). Both plant communities (PMS and RS) encompass the highest number of Mexican genera, 34 and 27, respectively. Many of these genera are found in flat plains and mountains of south and west Texas (Correll & Johnston 1970).

The oak forest (OF), oak-pine forest (OPF), and pine-forest (PF), by far, cover the largest amount of temperate and North American origin genera. Most of these are from temperate and Nearctic origin, and almost always are restricted to these forests. Among the most conspicuous elements in the landscape are *Abelia*, *Acer*, *Aquilegia*, *Arenaria*, *Arracacia*, *Ceanothus*, *Cercis*, *Cornus*, *Crataegus*, *Geranium*, *Gibasis*, *Hexalectris*, *Lathyrus*, *Lenophyllum*, *Malaxis*, *Monotropa*, *Omphalodes*, *Parthenocissus*, *Phacelia*, *Physocarpus*, *Pinguicola*, *Prunus*, *Ranunculus*, *Securigera*, *Silene*, *Sisyrinchium*, *Stachys*, *Staphylea*, *Thalictrum*, *Tilia*, *Torilis*, *Toxicodendron*, *Triodanus*, *Ulmus*, *Urtica*, *Vaccinium*, and *Veronica*. The oak forest (OF) has the third highest number of Mexican genera with (23).

The juniper forest harbors the highest number of genera (77) with typically North American distribution. The most common genera are *Ascyrum*, *Calylophus*, *Cercocarpus*, *Conopholis*, *Echeandia*, *Fendlera*, *Fendlerella*, *Helenium*, *Hemichaena*, *Heuchera*, *Ipomopsis*, *Monarda*, *Nothoscordum*, *Onosmodium*, *Pedimelum*, *Phanerophlebia*, *Physaria*, *Pyrrhopappus*, *Schkhuria*, *Sisyrinchium*, and *Stephanomeria*. Many of them are shared with the other forest types but are rarely found in the scrublands.

### DISCUSSION AND CONCLUSIONS

The Mexican Transition Zone (Darlington 1957; Halffter 2003) is a complex area where the neotropical and the Nearctic biotic elements overlap. It is an area with *in situ* evolution of many endemic taxa, and, is equivalent to the Mesoamerican Mountain Province (Cabrera & Willink 1973), to the Mesoamerican Mountain Region (Rzedowski 1978), in part to the Madrean sclerophyllous vegetation (Graham 1999), and to the Mexican Component of Mountain (Morrone & Márquez 2003). According to Rzedowski (1998), the Mexican flora has three basic geographic elements: meridional, boreal, and endemic (autochthonous). Endemism is high in plant communities in the north (arid areas) (Rzedowski 1973, 1978, 1988; Medellín-Leal 1982) as well as in southern Mexico (tropical and subtropical) (Graham 1998).

Most of the surface of the Cumbres de Monterrey National Park belongs to the Sierra Madre Oriental, located into the Mexican Transition Zone, and consists of a series of folded strata mountains, forming deep canyons crossed by narrow intermountain valleys, reaching a significant altitudinal gradient from 700 to 3400 m. This factor had favored the predominance of species of temperate affinity in the highest and rugged parts of the mountains such as *Quercus*, *Pinus*, and other conifers.



TABLE 4. Origin and number of genera recorded by plant community in the CMNP, Nuevo Leon, Mexico.

Plant community	Calid	Temperate	Cosmopolitan	Mexican	Neotropical	North American mainly
Piedmont scrub	122	42	26	34	130	57
Microphyllous scrubland	65	12	11	22	61	42
Rosetophyllous scrubland	61	16	13	27	64	43
Oak forest	66	102	28	23	76	64
Oak-pine forest	26	106	20	13	34	49
Pine forest	8	73	9	3	16	31
Juniper forest	15	43	10	9	20	69

In lower parts, the ravines, protected from sunlight incidence, and higher soil moisture, it is common to find plant communities typical of tropical elements (Rzedowski 1981). At lower altitudes (500 to 800 m), on the windward slopes with deep sedimentary soils (limestones and shales) of the CMNP, a continuous strip of piedmont scrub is found (Estrada et al. 2012a). This plant community is mainly composed by low, both deciduous (during the dry season) and perennial-leaved shrubs with a distinctly tropical floristic composition. The piedmont scrub has commonly dense canopy cover, and the tree-shrub strata is most frequently composed of *Acacia*, *Havardia*, *Zanthoxylum*, *Helietta*, *Cordia*, and *Diospyros*. Common associates of the piedmont scrub include affiliates of northern Mexico *Amyris madrensis*, *Vauquelinia corymbosa*, *Croton suaveolens*, and *Leucophyllum frutescens*. On the windward slopes, from 700 m and up, as well as in moist ravines, where seasonal streams drain during the rainy season, the piedmont scrub form ecotones with the oak-forest.

In some areas of the Park it is often difficult to find homogeneous oak-forest (*Quercus* spp.), since it is often mixed with other plant communities, such as the pine-forest and chaparral (dwarf oaks). These arboreal (or shrub) strata are composed mainly of Nearctic elements such as *Quercus*, *Arbutus*, *Carya*, *Cercis*, and *Platanus*, mixed with neotropical elements such as *Bauhinia*, *Croton*, *Litsea*, *Polypodium*, *Rhus*, *Ipomoea*, and *Commelina*. Furthermore, within this forest it is also common to find some genera with a preponderant xeric affinity such as *Agave*, *Bouteloua*, *Mammillaria*, and *Aphanostephus*.

In the highest parts of the mountains of the CMNP, from 1600 m up, the species of *Pinus* are dominant in the tree strata, most of them with monopodial and straight stems. The herbaceous diversity is lower here than in lower parts. In the wettest parts from the windwards in medium altitudes (1800–2000 m), the pine-forest is composed mainly of *P. teocote*, *P. pseudostrobus*, *P. montezumae*, *P. strobiformis*, and *P. greggii*. Occasionally this plant community constitutes ecotones with oak-forest, while in the driest areas it is common to find pure forest of *P. cembroides*. Sometimes, those constitute ecotones with xerophyllous scrublands on the leeward area adjacent to Mexican High Plateau (Altiplano Mexicano). The highest peaks, pine-forest leads to non-*Pinus* conifer forest, all of them of Nearctic affinity such as *Pseudotsuga*, *Abies*, *Juniperus*, and *Cupressus*. These forests tolerate low temperatures most of the year and occasionally snowfall. Two of these genera have patched distributions in the Park: *Taxus globosa* (a typical Nearctic element) and *Picea chihuahuana* var. *martinezii* (former *Picea martinezii* (Eckenwalder 2009)), a temperate species, endemic for Nuevo Leon.

On the western part of the CMNP, on leeward slopes, the rain shadow becomes evident to the arid area; the intermountain valleys composed of alluvial sediments are surrounded by limestone steep cliffs, showing a high incidence of endemic elements characteristic of the High Plateau and the Mexican Xerophytic Region (Rzedowski 1979). The representative plant community belongs to the rosetophyllous scrubland, highlighting species from *Agave*, *Hechtia*, *Hesperaloe*, *Nolina*, and *Yucca*.

The CMNP has a rich plant diversity. Most of its flora is autochthonous and from warm and tropical origin, especially those that develop from the Tamaulipan thornscrub and piedmont scrub. Also, a large number of plants, mainly shrubs and trees such as *Quercus*, *Pinus*, *Juniperus*, *Cornus*, *Abies*, *Cercis*, *Platanus*, *Prunus*, *Staphylea*, and *Pseudotsuga* from temperate climates, are found and are dominant in the forest areas. This assemblage, similar in structure and composition, is also found in mid-latitude in North America and in the Mediterranean region (Graham 1999). The flora in the dry area of the CMNP shares similarities with those ele-



ments of the Chihuahuan and Sonoran Desert, such as *Larrea tridentata* (Hunizker et al. 1972), and genera such as *Caesalpinia*, *Celtis*, *Cercidium*, *Condalia*, *Cryptantha*, *Demanthus*, *Evolvulus*, *Flourensia*, *Gaillardia*, *Hedeoma*, *Hymenoxys*, *Gilia*, *Malvastrum*, *Mentzelia*, *Polygonum*, *Proboscidea*, *Salvia*, *Schkuhria*, *Sida*, and *Ziziphus*, among others (Raven 1963; Solbrig 1972). CMNP integrates patches of deciduous forest, very similar in plant composition to those of northeastern North America recognized by Graham (1999), and the oak-hickory (Marroquín 1968), oak-pine, and oak-hickory-*Taxodium* are the most common associations in the wettest and warmer areas (mainly in the municipality of Santiago) between piedmont scrub and oak forest. At higher elevations occur *Acer*, *Cercis*, *Cornus*, *Fraxinus*, *Juglans*, *Magnolia*, *Ostrya*, *Prunus*, *Rhus*, *Tilia*, and *Ulmus*. These genera and several more have been cited in previous works showing disjunctions between eastern United States and eastern Mexico (McVaugh 1943; Miranda & Sharp 1950).

All plant communities are primarily Mexican genera. However, the highest number of Mexican genera is distributed in the piedmont scrub and rosetophyllous scrubland, in the arid part of the CMNP. Most of the endemic species belong to Asteraceae and Fabaceae.

### Main families and representative genera in the CMNP

The 11 most diversified families include 50% of the total flora, and can be used as a parameter to establish some comparisons of CMNP regarding the global diversity (Table 5). Eight of the flowering plant families have subcosmopolitan distribution (Asteraceae, Brassicaceae, Euphorbiaceae, Lamiaceae, Fabaceae, Malvaceae, Poaceae, and Solanaceae), one (Rubiaceae), tropical, and one (Fagaceae) tropical-montane-temperate (Thorne 1992, 2000). Pinaceae shows a temperate distribution (Eckenwalder 2009). Two families, (Cactaceae), with tropical temperate distribution and Pteridaceae, (mainly in tropical-subtropical areas; (Mickel & Smith 2004), are also well represented in the Park.

The Asteraceae, Fabaceae, and Poaceae are the most representative family plants in Mexico (Rzedowski 1998); the same diversification pattern occurs also in the study area. The family Asteraceae has the highest number of species (32,000) (Hendrych 1985). This family is most diverse in mountainous tropical regions, tropical areas, and in the warmer temperate regions (Turner & Nesom 1998). From the 2700 species (and 323 genera) occurring in Mexico, 96% of them (2600) are believed to be endemic (Turner & Nesom 1998). This considerable diversity is undoubtedly due to the predominance of subtropical climate, and mountains adjacent to desert regions (Turner & Nesom 1998). The study area has a similar pattern of climate (subtropical and arid) and topography (warm and cool mountains and dry plains) which undoubtedly favors such high diversity, covering 29% of the genera and 7.5% of the species occurring in Mexico. *Ageratina*, *Verbesina*, and *Senecio* are the most diversified genera in Mexico (Turner & Nesom 1998) and also in CMNP.

After the Asteraceae, Fabaceae is the second family of plants most diversified in Mexico (135 genera and 1724 species), growing in all ecosystems, but most numerous in tropical areas (Sousa & Delgado 1998), and 66% (121) of the genera occurring in Mexico have been recorded for the Mexican northern States (Estrada & Martínez 2003). The CMNP contains 37% and 7% of the genera and species, respectively, for Mexico. Several genera deserve mention due to their importance in the landscape. *Havardia* is a Mexican genus with nine species, six of them endemic to Mexico (Barneby & Grimes 1997); *Havardia pallens* is the only species found in the CMNP. However, it is one of the most common species in plant associations of the Tamaulipan thornscrub and piedmont scrub (Estrada et al. 2012a). *Phaseolus*, another Mexican genus, encompasses 37 species, highly diversified in Mexico (Freytag & Debouck 2002). Thirty-four of them occur in Mexico, of which 18 are endemic (Sousa & Delgado 1998). Nineteen percent of the total species of *Phaseolus* are found in the PNCM, occurring mainly in oak forest. *Dalea*, another typically Mexican genus, includes 161 species (Barneby 1977), 113 of them distributed all over Mexico. Ten of them (10%) reach the CMNP, mostly found in semiarid areas. *Desmodium* is a genus widely distributed in Mexico with almost 80 species (50 of them endemic) (Lewis et al. 2005). The study area harbors 12.5% of the total species of Mexico, and most of the 10 species found in CMNP inhabit oak-pine forest while a few of them (*D. grahamii* and *D. lindheimeri*) are distributed also in scrublands. Two highly diversified genera in Mexico, *Mimosa* (Barneby 1991) and *Acacia* (Rico-Arce 2007), are found in all plant communities in the CMNP. They are important elements because of their abundance and canopy cover, especially



TABLE 5. Plant families most diversified in CMNP compared to the diversity of the State of Nuevo Leon, Mexico, and worldwide (<sup>1</sup>Hendrych 1985; <sup>2</sup>Valdés & Cabral 1998; <sup>3</sup>Lewis et al. 2005; <sup>4</sup>Walker et al. 2004; <sup>5</sup>Mabberley 1997; <sup>6</sup>FLN 2010; <sup>7</sup>Fryxell 1988; <sup>8</sup>Rzedowski & Rzedowski 2005; <sup>9</sup>Martínez et al. 2011; <sup>10</sup>Mabberley 1997; <sup>11</sup>Turner & Nesom 1998; <sup>12</sup>Sousa & Delgado 1998; <sup>13</sup>Lewis et al. 2005; <sup>14</sup>Cornejo-Tenorio & Ibarra-Manríquez 2011; <sup>15</sup>Martínez-Gordillo et al. 2002; <sup>16</sup>Henrickson & Johnston 1997; <sup>17</sup>Borhidi & Diego-Pérez 2002; <sup>18</sup>Villarreal & Estrada 2008).

Family	Genera-species worldwide	Genera-species in Mexico	Genera-species in Nuevo Leon <sup>18</sup>	Genera-species in CMNP
Asteraceae	1000–32,000 <sup>1</sup>	325–2700 <sup>11</sup>	148–41	104–230
Poaceae	800–10,000 <sup>2</sup>	183–1151 <sup>12</sup>	97–301	51–134
Fabaceae	727–19,325 <sup>3</sup>	135–1724 <sup>13</sup>	76–258	50–120
Lamiaceae	223–5600 <sup>4</sup>	27–512 <sup>14</sup>	17–78	17–57
Euphorbiaceae	317–8100 <sup>5</sup>	50–826 <sup>15</sup>	15–85	15–51
Brassicaceae	338–3780 <sup>6</sup>	(27 <sup>8</sup> –42 <sup>16</sup> )–(52 <sup>8</sup> –123 <sup>16</sup> )	30–61	15–29
Malvaceae	>100–2000 <sup>7</sup>	55–372 <sup>7</sup>	21–60	14–25
Rosaceae	100–3000 <sup>8</sup>	(15 <sup>8</sup> –17 <sup>16</sup> )–36 <sup>8,16</sup>	20–47	13–25
Solanaceae	96–2300 <sup>9</sup>	38–394 <sup>9</sup>	19–70	12–28
Rubiaceae	630–10,200 <sup>10</sup>	85–500 <sup>17</sup>	14–34	11–20

in areas with anthropogenic influence. However, *Mimosa* (4 species) and *Acacia* (6) are not as diversified as other genera of this family. Despite legumes being distributed all over the Park, the oak forest possesses the highest diversity, mainly in the form of herbs and shrubs, but shrubs are quantitatively most abundant in scrublands.

The Poaceae are the fourth most diversified family of plants in the world (Valdés & Cabral 1998). In Mexico it is represented by 183 genera and 1151 species (Gould 1979; Beetle 1983, 1987a, 1987b; Beetle et al. 1991, 1995, 1999; Valdés & Cabral 1998). According to Cross (1980), the Poaceae are abundant in “open communities.” This could be the reason that this family, while being the third most diversified in CMNP (42 genera, 93 species), does not constitute a physiognomically important part of the landscape, except for some weeds such as *Cynodon dactylon*, *Cenchrus ciliaris*, *Rhynchelytrum repens*, and *Eleusine indica*, all occasionally found in fragmented patches with anthropogenic disturbance. *Paspalum*, a New World genus (Renvoize 1995; Sánchez-Ken 2010), with almost 87 species in México (Guzmán & Santana 1987), 20 of which are endemic, is one of the most diversified genera in PNCM (8 species), inhabiting almost all plant communities.

Lamiaceae is the fourth most diversified family in CMNP. Four of its genera have five or more species (*Stachys*, *Hedeoma*, *Scutellaria*, and *Salvia*). By far, *Salvia* dominates over the other genera: it represents almost 1,000 species around the world (Walker & Elisen 2001). Mexico is considered one of the areas with the highest diversity of the genus in the world (Ramamoorthy 1984; Walker et al. 2004) with almost 300 species. It is considered the second most diversified in Mexico (Cornejo-Tenorio & Ibarra-Manríquez 2011). Approximately 6% of the species in Mexico are in the study area. Two of the endemic species recorded for the State of Nuevo Leon are distributed in the CMNP: *Scutellaria monterreyana* and *Stachys vulnerabilis* (Villarreal & Estrada 2008). Three of the most common cultivated mints—*Mentha pipertia*, *M. spicata*, and *M. rotundifolia*—are introduced in America (Bailey 1951) and are used as ornamental and medicinal plants (Estrada et al. 2012b). They are commonly found in CMNP (Villarreal & Estrada 2008).

Malvaceae (with more than 100 genera and 2000 species) is mainly American and probably from South America in origin. However, Mexico appears to represent a region of diversification of this family (Fryxell 1988); the family is most richly developed in the lower elevations along both coasts (Pacific and Gulf). CMNP includes 25% of the genera and 6.7% of the species of Malvaceae occurring in Mexico, most of them developing in the lower parts of the Park and commonly found in disturbed areas. The largest genera found in Mexico (as well as worldwide) are *Abutilon*, *Hibiscus*, *Sida*, and *Pavonia* (Fryxell 1988). Several species of them reach CMNP, especially those of *Hibiscus* (11% of the Mexican species) and *Sida* (11.5% of the Mexican species). Also, several species of genera “almost endemic” to Mexico (Fryxell 1988), such as *Anoda*, *Allowissadula*, and *Meximalva*, are distributed in CMNP.



The subcosmopolitan Brassicaceae includes species especially distributed in temperate areas (Flora of North America 2010). Most of them are distributed in the Northern Hemisphere (Rzedowski & Rzedowski 2005), with 616 of them occurring in the USA (Flora of North America 2010). There is not an exhaustive study of this family for Mexico. However, 27 genera and 52 species have been recorded for the Valle of Mexico (Rzedowski & Rzedowski 2005), and 30 and 123, respectively, for the Chihuahuan Desert Region (Henrickson & Johnston 1997). Half of those same genera and almost half of those species are also found in CMNP. Some genera such as *Lepidium*, *Eruca*, and *Sisymbrium* constitute an important part of the weeds found in abundance at low disturbed areas, while others such as *Cardamine*, *Diplotaxis*, *Lunaria*, *Physaria*, and *Thelypodium* are found most of the time in restricted higher altitudes in forest vegetation. *Rorippa nasturtium-aquaticum* grows abundantly on the banks of rivers and streams after rainy seasons.

The Rosaceae from CMNP includes mainly subshrubs, shrubs, and trees. Most of the genera recorded are almost the same (except for *Petrophytum* and *Agrimonia*) as those recorded for the Chihuahuan Desert region (CDR) (Henrickson & Johnston 1997). Most of the species inhabit cool areas, especially the wild ones. From the 36 species recorded for the CDR and Mexican Valley (Rzedowski & Rzedowski 2005), 70% of them are distributed in CMNP. *Crataegus*, *Rubus*, and *Rosa* are the most diversified genera.

Mexico is a center of diversity for Solanaceae (Cuevas-Arias et al. 2008). Most of its species are distributed in warm and temperate areas (Rzedowski & Rzedowski 2005). CMNP contains 31.5% of the genera and 6.5% of the species occurring in Mexico. Most of the species (64%) belong to four genera: *Capsicum*, *Nicotiana*, *Physalis*, and *Solanum*.

Rubiaceae is the fourth most diversified family in the world (Mabberley 1997), distributed mainly in tropical areas. This family is well represented in Mexico (Borhidi & Diego-Pérez 2002), and most of the species are distributed in the south region (Rzedowski 1978). In the study area 11.7% and 3.5% of the genera and species occur, respectively. The most diversified genera are *Galium* and *Hedyotis*, representing small herbaceous species, found in almost all plant communities. *Randia* is an important element of the piedmont scrub, sometimes as co-dominant species of this vegetation (Estrada et al. 2012a).

Mexico has one of the most highly diversified pteridophyte flora (ferns) in the world, inhabiting a broad range of habitats, consisting of 1,008 species and 124 genera (Mickel & Smith 2004). The CMNP includes 15% of the genera and 4% of the species for Mexico; most of the species inhabit shaded or partially shaded areas in oak and oak-pine forest. Among the most diversified genera in Mexico are *Asplenium* (86 species), *Selaginella* (30 species), *Thelypteris* (69), *Cheilanthes* (60), *Polypodium* (55), *Notholaena* (24), and *Adiantum* (35) (Mickel & Smith 2004). Several species of these genera reach CMNP, but only one, *Chelianthes chipinquensis*, is endemic for this area.

Euphorbiaceae is one of the most diverse families in the Angiosperms (Radcliffe-Smith 1987); 50 genera and 826 species have been recorded for Mexico (Martínez-Gordillo et al. 2002). This family is the ninth most diverse in CMNP; three of its genera, *Euphorbia*, *Croton*, and *Acalypha*, have most of the species (72%). CMNP possesses 9.1% of the *Euphorbia* (sensu lato) species occurring in Mexico (241).

The Cactaceae are native from America (Hunt 1999); this family is characteristic of the landscape in arid lands of Mexico (Bravo-Hollis 1978; Bravo-Hollis & Sánchez Mejorada 1991a, 1991b). Mexico has the richest diversity of Cactaceae (Guzmán et al. 2003). Surprisingly, CMNP is not as diverse in Cactaceae as other representative families. Even though there are arid areas on the western and the most northern portion of CMNP, this low diversity could be caused by the relative homogeneity of the landscape and altitude gradient where the microphyllous (in plains) and rosetophyllous scrublands (hills and piedmont) occur; both of them are quite homogeneous. CMNP contains 12% of the genera and 3.7% of the species registered for Mexico. Three typically Mexican genera of this family are the most diversified in CMNP: *Echinocereus*, *Mammillaria*, and *Opuntia*. One of the endemic cacti (*Echinocereus viereckii* ssp. *morricalii*) recorded for Nuevo Leon is found in the study area.

Much like the Cactaceae, the Agavaceae are not very diverse in the CMNP; they represent only 3.8% of the 261 species occurring in Mexico. However, 50% of its genera are present in CMNP. Within Agavaceae, *Agave* is the genus most diversified: 136 (Gentry 1998)–159 (García-Mendoza 2011) species, with almost 77% of these



endemic to Mexico (García-Mendoza 2011). *Agave albopilosa* is the only species of Agavaceae endemic to CMNP, restricted to tall cliffs, in lithosols.

Among the woody plants, *Quercus* is one of the most important, and the mountains of Mexico are the center of diversity for the Western Hemisphere (Nixon 1998). The oak forest contains the main component in terms of biomass, particularly in the oak-pine forest, chaparral (oak scrubland), and in the rain forest (Rzedowski 1978). The woody species exhibit several growth forms: rhizomatous shrubs, low trees, and tall trees. It is estimated almost 200–225 species of oak exist for the west hemisphere; from those, 130–135 species are distributed in Mexico, and 57 of them reach the eastern portion of Mexico (Nixon 1998). Oaks in eastern Mexico are distributed mainly in the highlands of the Sierra Madre Oriental in the State of Nuevo Leon (Nixon 1998). Almost half of these species (24, 42%) are found in the CMNP and, by far, are the most important in terms of canopy cover and density. The most common species of the CMNP are *Q. emoryi* and *Q. polymorpha*, associated with conifer forest and piedmont scrub, constituting ecotones among shrublands and forest.

Economically and ecologically *Pinus* and *Quercus*, are two of the most important genera in Mexico, distributed in all areas where mountains are present. The genus *Pinus* is represented by 90–210 species (Silba 1984; Styles 1998) of which 49 (45.5%) of them are found in Mexico (Styles 1998). The genus inhabits mainly temperate areas. The highest diversity centers, however, are located south of the Tropic of Cancer in the south of Mexico, Central America, and the Caribbean Islands (Styles 1998). According to Eckenwalder (2009), in the State of Nuevo Leon there are 10 genera and 34 species of conifers (Villarreal & Estrada 2008); of those, 15 species and 7 infraspecific categories belong to *Pinus*. Eight genera and 15 of these conifer species are found in CMNP, and, by far, *Pinus* is the most diversified genus (9 species). Its species are widely distributed above 850 m throughout the area of the Park. The most common is *P. pseudostrobus* in wet and temperate areas, while *P. cembroides* is the most common in the arid-temperate ones. *Pinus remota*, one of the pinyon group, occupies the dry-temperate valleys in the western portion of the Park. *Picea mexicana* var. *martinezii*, *Taxus globosa*, *Cupressus arizonica* var. *arizonica*, and *Pseudotsuga menziesii* have more restricted distributions. *Picea* and *Taxus* occur mainly in protected wet places; *Taxus* grows better along creeks with rocky soils (García-Aranda et al. 2012), while *Picea* has even more restricted distribution in the Park, growing only in one place (El Butano, 1300 m). The latter is an amazing area where *Abies*, *Juniperus*, *Picea*, *Pinus*, *Pseudotsuga*, and *Taxus* share a small (2–3 ha) bowl-shaped area, protected by 150–200 m tall cliffs where dense fogs form; that constitutes a unique microhabitat capable of sheltering such a high diversity of conifer genera.

The CMNP holds almost a third of the flora known to occur in the State of Nuevo Leon. Most of its flora is autochthonous. The dominant plant communities are scrublands and oak-pine forest. The highest diversity of species was recorded in the oak forest and piedmont scrub. Most of the flora recorded is from subtropical affinity. However, the highest parts accommodate many genera from temperate and cool regions. Two families, Cactaceae and Agavaceae, dominate in the arid environments of the Park but are scarcely represented in the forest and piedmont scrub. The most diversified plant families around the world, as in genera and as in species, are also dominant in the CMNP.

### Weeds and useful plants

A number of herbaceous weed species are present in the CMNP. They are dominant elements in the farms and halted crops fields and are evident in plains and valleys. One of the most common is *Rumex mexicanus*, which invades extensive areas after rains. Farmers and ranchers in the area mentioned the plant is used to feed cattle. Among the most conspicuous species introduced from Africa (Rzedowski & Rzedowski 1990) and present in the study area are *Cenchrus ciliaris*, *Cynodon dactylon*, *Eleusine indica*, *Leonotis nepetifolia*, *Rhynchelytrum repens*, *Ricinus communis*, and *Sorghum halepense*, found in small patches. Almost 240 species, 170 genera, and 69 families of plants that grow in the CMNP are commonly used in the local subsistence culture, most as medicinal products while others are used for human consumption, fodder for livestock, firewood, construction materials, live fences, etc. (Estrada et al. 2007). *Vicia villosa* is used for fodder in U.S.A. (Gunn 1979) and also grows in open fields together with *Rumex mexicanus*. Local residents said this species is preferred by cattle over other weeds.



## APPENDIX 1

List of taxa recorded at the Cumbres de Monterrey National Park, Nuevo Leon, Mexico, and endemic species (\*) for Nuevo León occurring in the CMNP. E.E. = Eduardo Estrada.

## PTERIDOPHYTA

## Anemiaceae

*Anemia adiantifolia* (L.) Sw., E.E. 16371, 16379.

## Aspleniaceae

*Asplenium resiliens* Kunze, E.E. 16292, 16354, 16445; TEX 237621, 237625.

*Phanerophlebia auriculata* Underw., E.E. 16510.

*Phanerophlebia umbonata* Underw., E.E. 11303, 16143, 16517.

*Scolopendrium scolopendrium* H. Karst., E.E. 16338.

## Equisetaceae

*Equisetum hyemale* L. var. *affine* (Engelm.) A.A. Eaton, E.E. 16569; TEX 267678.

*Equisetum laevigatum* A. Braun, E.E. 16079, 16474, 18898.

## Polypodiaceae

*Phlebodium aureum* (L.) J. Sm., E.E. 11303a.

*Pleopeltis guttata* (Maxon) E.B. Andrews & Win, J.V. 8563, TEX 214760.

*Pleopeltis polylepis* T. Moore var. *erythrolepis* (Weath.) T. Wendt, E.E. 16518.

*Pleopeltis polylepis* T. Moore var. *polylepis*, TEX 255035.

*Pleopeltis polypodioides* (L.) E.G. Andrews & Windham var. *michauxiana* (Weath.) E.G. Andrews & Windham, LL 232208, 232212; TEX 232209, 232210.

*Polypodium plesiosorum* Kunze, LL 232130; TEX 232128, 232131, 232132, 255032.

*Polypodium subpetiolatum* Hook., TEX 232280.

## Pteridaceae

*Adiantum capillus-veneris* L., E.E. 14648, 16520, 16565; LL 236380; TEX 236381, 236382, 236388, 236390, 236565.

*Argyrochosma microphylla* (Mett. ex Kuhn) Windham, E.E. 19529.

*Aspidotis meifolia* (D.C. Eaton) Pic. Serm., LL 269149.

*Astrolepis integerrima* (Hook.) D.M. Benham & Windham, TEX 268302, 268323.

*Astrolepis sinuata* (Lag. ex Sw.) D.M. Benham & Windham, E.E. 16263.

*Cheilanthes aemula* Maxon, LL 268448.

*Cheilanthes alabamensis* (Buckley) Kunze, E.E. 11317, 11319; LL 268437; TEX 268466, 268470, 268471.

*Cheilanthes bonariensis* (Willd.) Proctor, E.E. 16270; LL 268692.

\**Cheilanthes chipinquensis* Knobloch et Lellinger; BEP. (Mickel & Smith 2004).

*Cheilanthes eatonii* Baker, E.E. 16493; TEX 268766.

*Cheilanthes horridula* Maxon, TEX 268958.

*Cheilanthes microphylla* (Sw.) Sw., E.E. 15999, 16135, 16227, 16257, 16269, 16290, 16453, 16637, 16734, 19286, 19338, 19518; TEX 269184, 269185, 269186, 269187.

*Cheilanthes tomentosa* Link, TEX 237221, 269312.

*Mildella fallax* (M. Martens & Galeotti) G.L. Nesom, LL 269410.

*Mildella intramarginalis* (Kaulf ex Link) Trevis. var. *intramarginalis*, E.E. 16293.

*Notholaena aschenborniana* Klotzsch, E.E. 16258; TEX 269455, 269456.

*Notholaena candida* (Mart. & Galeotti) Hook. var. *copelandii* (C.C. Hall) Tryon, E.E. 11293.

*Pellaea atropurpurea* (L.) Link, E.E. 16000, 16278, 16638; LL 269927.

*Pellaea ovata* (Desv.) Weath., E.E. 16202.

*Pteris cretica* L., E.E. 16505, 16511, 16543; LL 268061, 268062; TEX 268079, 268089, 268093.

*Pteris longifolia* L., E.E. 14646, 16181, 16563, 19093; G.H. 24120, 24417.

*Pteris vittata* L., TEX 268116, 268124, 268163.

## Schizaceae

*Llavea cordifolia* Lag., E.E. 11295, 16127, 16556; LL 236065, 236066, 236090; TEX 236047, 236048, 236050, 236051, 236067, 236097.

## Selaginellaceae

*Selaginella delicatissima* Linden ex A. Braun., TEX 267369.

*Selaginella lepidophylla* (Hook. & Grev.) Spring, TEX 267407, 267425.

*Selaginella novoleonensis* Hieron, G.H. 24122.

*Selaginella pallescens* (C. Presl.) Spring, E.E. 15997; TEX 267501.

*Selaginella pilifera* A. Braun, E.E. 16273; TEX 267562, 267564, 267565, 267567, 267568.

*Selaginella wrightii* Hieron, TEX 267660, 267664.

## Thelypteridaceae

*Thelypteris concinna* (Willd.) Ching, E.E. 16641.

*Thelypteris ovata* R.P. St. John var. *lindheimeri* (C. Chr.) A.R. Sm., E.E. 11313.

*Thelypteris rudis* (Kuntze) Proctor, E.E. 16514, 16573.

## GYMNOSPERMAE

## Cupressaceae

*Cupressus arizonica* Greene, E.E. 11809, 19561; G.H. 24371; TEX 144937.

*Juniperus deppeana* Steud., E.E. 11282.

*Juniperus flaccida* Schltdl., E.E. 12741, 16020; G.H. 25910, LL 145516; TEX 145514.

## Ephedraceae

*Ephedra antisiphilitica* Berland. ex C.A. Mey, E.E. 14538.

## Pinaceae

*Abies vejari* Martinez, E.E. 11810, 15466.

\**Picea chihuahuana* M. Martínez var. *martinezii* (T.F. Patt.) Eckenwalder, E.E. 11805, 15465; TEX 370052.

*Pinus cembroides* Zucc., E.E. 19558, 19568.

\**Pinus culminicola* Andresen & Beaman var. *johannis* (Rob.-Pass.) Silba, LL 144362.

*Pinus remota* (Little) L.H. Bailey & Hawksw., E.E. 15199.

*Pinus greggii* Engelm. ex Parl., E.E. 12731, 15987.

*Pinus hartwegii* Lindl., TEX 144335.

*Pinus lumholtzii* B.L. Rob. & Fernald, E.E. 11813 (cultivado).

*Pinus montezumae* Lamb., LL 144461.

*Pinus pinceana* G. Gordon (Favela et al. 2009).

*Pinus pseudostrobus* Lindl. var. *pseudostrobus* Lindl., E.E. 11281, 11814, 15436, 16425; G.H. 24457, 24958, 24959; LL 144627; TEX 144609, 144618, 144620, 144625.

*Pinus teocote* Schltdl. & Cham., E.E. 11803, 11812, 14662, 15448, 15988, 16478a, 19123, 19156, 19174, 19384; TEX 144723, 144726.

*Pseudotsuga menziesii* (Mirbel) Franco, J.V. 7116.

## Taxaceae

*Taxus globosa* Schltdl., E.E. 11804, 15467, 15993, 16129, 16299, 16373, 16383, 16507, 16545, 19155, 19436.

## Taxodiaceae

*Taxodium mucronatum* Ten., G.H. 24168; LL 144900, TEX 144903.



## MONOCOTYLEDONEAE

## Agavaceae

- \**Agave albopilosa* Cabral, Villarreal & E. Estrada, E.E. 20719.  
*Agave bracteosa* S. Watson ex Engelm., E.E. 12749; TEX 113659.  
*Agave lecheguilla* Torr., E.E. 16204, 19637.  
*Agave striata* Zucc., E.E. 16208, 16652.  
*Agave victoriae-reginae* T. Moore, E.E. 12748; TEX 113815, 113857, 183034.  
*Hesperaloe funifera* (K. Koch) Trel. ssp. *funifera*, E.E. 19638; E.E. 19475.  
*Manfreda maculosa* Rose, E.E. 16130, 16321, 16372.  
*Manfreda variegata* (Jacobi) Rose, G.H. 24407; TEX 111430.  
*Yucca filifera* Chabaud, E.E. 16232, 19543, 19636, 19638, 19639.

## Alliaceae

- Allium glandulosum* Link & Otto., E.E. 16635, 16455; J.V. 8662.  
 \**Allium hintoniorum* B.L. Turner, LL 112240; TEX 112239.  
*Allium sativum* L., E.E. 16370.  
*Nothoscordum bivalve* (L.) Britton, LL 177743; TEX 177766.

## Amaryllidaceae

- Cooperia pedunculata* Herb., G.H. 24413.

## Anthericaceae

- Echeandia chandleri* (Greenm. & C.H. Thomps.) Cruden, E.E. 18917.  
*Echeandia flavescens* (Schult. & Schult. F.) Cruden, E.E. 16632.

## Araceae

- Arisaema dracontium* (L.) Schott & Endl., E.E. 16658; LL 176330.  
*Xanthosoma sagittifolium* (L.) Schott & Endl. TEX 214787.

## Asphodelaceae

- Asphodelus fistulosus* L., E.E. 14637, 16025, 19266.

## Bromeliaceae

- Hechtia texensis* S. Watson, E.E. 19635.  
*Tillandsia bartramii* Elliot, LL 176680; TEX 176684.  
*Tillandsia parryi* Baker, LL 183060.  
*Tillandsia recurvata* Gaudich., E.E. 19316.  
*Tillandsia usneoides* (L.) L., E.E. 19335, 19367.

## Cannaceae

- Canna indica* L., E.E. 16557, 16600.

## Commelinaceae

- Commelina dianthifolia* Delile, E.E. 14839.  
*Commelina diffusa* Willd. ex Kunth, TEX 110235.  
*Commelina erecta* L. var. *angustifolia* (Michx.) Fernald, E.E. 16243; G.H. 24237, 24330; TEX 110388.  
*Gibasis karwinskyana* (Roem. & Schult.) Rohweder ssp. *palmeri* D.R. Hunt, G.H. 24401.  
*Gibasis pellucida* (Martens & Galeotti) D.R. Hunt, E.E. 14653; G.H. 24100; TEX 110655.  
*Tradescantia crassifolia* Cav., E.E. 18963.  
*Tradescantia pringlei* S. Watson, E.E. 13336, 16781; J.V. 7099, 8684.  
*Tripogandra angustifolia* (B.L. Rob.) Woodson, E.E. 19072.

## Cyperaceae

- Bulbostylis juncooides* (Vahl) Kük. ex Osten, LL 174098.  
*Carex leucodonta* T. Holm, E.E. 16309.  
*Carex planostachys* Kunze, E.E. 16329.  
*Cyperus hermaphroditus* (Jacq.) Standl., TEX 174419.  
*Cyperus niger* Ruiz & Pav., TEX 174658, 174668.  
*Cyperus ochraceus* Vahl, E.E. 16193, 16225, TEX 174695.  
*Cyperus odoratus* L., TEX 245898.  
*Cyperus pallidicolor* (Kük.) G.C. Tucker, E.E. 16472, 16488, 16506; LL 174738.  
*Cyperus retroflexus* Buckley, E.E. 16655, 16739, 18945.  
*Cyperus rotundus* L., TEX 245898.  
*Eleocharis geniculata* (L.) Roem. & Schult., TEX 175098, 175101.

*Eleocharis montevidensis* Kunth, TEX 245724.

*Fuirena simplex* Vahl, E.E. 16566, TEX 175629, 175630.

*Rhynchospora colorata* (L.) H. Pfeiff., E.E. 16578; TEX 175705.

*Scleria oligantha* Michx., LL 175969.

## Hydrocharitaceae

- Najas guadalupensis* (Spreng.) Morong, TEX 142268, 142269, 142274.

## Hypoxidaceae

- Hypoxis mexicana* Schult., E.E. 16627.  
*Hypoxis pulchella* G.L. Nesom, LL 113570; TEX 113568, 370288.

## Iridaceae

- Eustylis purpurea* (Herb.) Engelm. & A. Gray, E.E. 16320.  
*Sisyrinchium demissum* Greene, E.E. 16053.  
*Sisyrinchium dimorphum* R.L. Oliv., G.H. 24133.  
 \**Sisyrinchium novoleonense* G.L. Nesom & L. Hernández., TEX 278187.  
*Sisyrinchium scabrum* Cham. & Schltdl., E.E. 15990, 16051; TEX 278346.  
*Sisyrinchium schaffneri* S. Watson, J.V. 7137.  
*Tigridia pavonia* (L.) DC., TEX 278848.

## Juncaceae

- Juncus nodosus* L., TEX 177027.

## Melanthiaceae

- Schoenocaulon macrocarpum* Brink., J.V. 8676.  
*Schoenocaulon texanum* Scheele, E.E. 16339, 16386.  
*Zigadenus virescens* (Kunth) J.F. Macbr., LL 177187; TEX 177190.

## Nolinaceae

- Dasyllirion berlandieri* S. Watson, G.H. 24421; TEX 111114, 111128.  
*Dasyllirion texanum* Scheele, E.E. 16180.  
*Nolina caespitifera* Trel., E.E. 19519.

## Orchidaceae

- Corallorhiza bulbosa* A. Rich. & Galeotti, E.E. 19612.  
*Corallorhiza maculata* Greene, E.E. 16262.  
*Corallorhiza wisteriana* Conrad, TEX 190364.  
*Dichromanthus cinnabarinus* (La Llave & Lex.) Garay, TEX 190377.  
*Goodyera oblongifolia* Raf., LL 190387; TEX 190385.  
*Govenia liliacea* Lindl., G.H. 25470.  
*Hexalectris grandiflora* (A. Rich. & Galeotti) L.O. Williams, G.H. 25453.  
*Malaxis hintonii* Todzia, TEX 190414, 190416.  
*Malaxis wendtii* Salazar, G.H. 25934.  
*Platanthera brevifolia* (Green) Kraenzl., TEX 190451.  
*Platanthera limosa* Lindl., E.E. 16342.  
*Prescottia tubulosa* (Lindl.) L.O. Williams, TEX 190469.  
*Schiedeella rubrocalosa* (B.L. Rob. & Greenm.) Burns-Bal., TEX 190492.

## Poaceae

- Andropogon glomeratus* (Walter) Britton Sterns & Poggneb., TEX 142604.  
*Aristida glauca* (Nees.) Walp., TEX 142902.  
*Aristida purpurea* Nutt. var. *nealleyi* (Vasey) Allred, TEX 143037.  
*Aristida purpurea* Nutt. var. *purpurea*, E.E. 14700, 16662, 16688, 19492.  
*Arundinella berteroniana* (Schult.) Hitchc. & Chase, E.E. 16571, 19697; TEX 143340, 143344.  
*Avena fatua* L. var. *fatua*, E.E. 16096.  
*Avena fatua* L. var. *sativa* (L.) Husskn., TEX 143396.  
*Bothriochloa ischaemum* (L.) Keng var. *songarica* (Rupr. ex Fisch & C.A. Mey.) Celarier & J.R. Harlan, E.E. 19687.  
*Bothriochloa laguroides* (DC.) Herter var. *torreyana* (Steud.) M. Marchi & Longi-Wagner, E.E. 16740.  
*Bothriochloa saccharoides* (Sw.) Rydb., E.E. 11318; LL 143589; TEX 142656, 143601, 143608.



- Bothriochloa saccharoides* Rydb. var. *torreyana* (Steud.) Gould, E.E. 16740.
- Bouteloua barbata* Lag., TEX 143717, 143730.
- Bouteloua curtipendula* (Michx.) Torr., E.E. 11309, 16395, 16783, 19175, 19217; LL 143926.
- Bouteloua curtipendula* (Michx.) Torr., var. *caespitosa* Gould & Kappadia, TEX 143834.
- Bouteloua repens* (Kunth) Scribn., E.E. 16245, 16670; TEX 246399.
- Bouteloua trifida* (Thurb.) ex S. Watson, E.E. 16723.
- Brachypodium mexicanum* (Roem & Schult) Link, E.E. 16315.
- Briza minor* L., E.E. 13313, 16450.
- Briza subaristata* Lam., E.E. 15453, 19588; TEX 246759.
- Bromus anomalus* Rupr. ex E. Fourn., TEX 246788.
- Bromus carinatus* Hook. & Arn., E.E. 16391; 16469.
- Bromus catharticus* Vahl, E.E. 14664, 15976, 16026.
- Bromus meyeri* Swallen, E.E. 12730; TEX 246944, 246946.
- Buchloe dactyloides* (Nutt.) Engelm., E.E. 16414.
- Cenchrus incertus* M.A. Curtis, E.E. 16679.
- Chasmanthium latifolium* (Michx.) H.O. Yates, TEX 245268.
- Chloris andropogonoides* E. Fourn., TEX 245273.
- Chloris submutica* Kunth, E.E. 16440.
- Cynodon dactylon* (L.) Pers., E.E. 16189, 16853, 18968, 19209, 19243, 19675.
- Dasyochloa pulchella* (Kunth) Willd. ex Rydb., E.E. 16690, 16716.
- Dichanthelium acuminatum* (Sw.) Gould & C.A. Clark, E.E. 16349, 16570, 19696; TEX 186235.
- Dichanthelium pedicellatum* (Vasey) Gould, TEX 186275, 186276, 186277.
- Dichanthelium sphaerocarpon* (Elliott) Gould, LL 186284.
- Digitaria bicornis* (Lam.) Roem. & Schult., E.E. 16663, 19691.
- Digitaria californica* (Benth.) Henrard, E.E. 19706.
- Digitaria ciliaris* (Retz.) Koeler, E.E. 16205, 16685, 16725, 16772, 18975; TEX 186352.
- Digitaria cognata* (Schult.) Pilg. ssp. *pubiflora* (Vasey) Wipff, TEX 186369.
- Digitaria hitchcockii* (Chase) Stuck., E.E. 16726.
- Digitaria insularis* (L.) Fedde, TEX 158502.
- Digitaria sanguinalis* (L.) Scop., E.E. 16838; TEX 186403.
- Eleusine indica* (L.) Gaertn., E.E. 16194, 16779, 19069.
- Elymus canadensis* L., E.E. 16119, 16390, 16458, 19005.
- Elymus longifolius* (J.G. Smith) Gould, E.E. 14868.
- Elymus pringlei* Scribn. & Merr., TEX 186720, 186721.
- Enneapogon desvauxii* P. Beauv., TEX 186795.
- Eragrostis barrelieri* Daveau, E.E. 16623.
- Eragrostis intermedia* Hitchc. var. *oreophila* (L.H. Harv.) Witherspoon, TEX 188006.
- Eragrostis lugens* Nees., LL 188025; TEX 188023.
- Eragrostis mexicana* (Hornem.) Link ssp. *mexicana*, E.E. 16285; G.H. 24972.
- Eragrostis pilosa* (L.) P. Beauv., E.E. 16544, 16682.
- Erioneuron pilosum* (Buckley) Nash, E.E. 19495; TEX 188476, 188492.
- Festuca amplissima* Rupr., E.E. 19149; TEX 80617.
- Glyceria striata* (Lam.) Hitchc., TEX 255157.
- Hyparrhenia hirta* (L.) Stapf, TEX 80877, 80882.
- Koeleria pyramidata* (Lam.) P. Beauv., LL 81001.
- Leersia monandra* Sw., TEX 81256.
- Leptoloma cognata* (Schult.) Chase, E.E. 16683, 16719.
- Lycurus phleoides* Kunth, E.E. 16397.
- Muhlenbergia dubia* Hemsl., E.E. 14707; TEX 81780.
- Muhlenbergia emersleyi* Vasey, E.E. 16410.
- Muhlenbergia utilis* (Torr.) Hitchc., TEX 82594.
- Nassella leucotricha* (Trin. & Rupr.) Barkwort, E.E. 16052, 16174, 16335; J.V. 8597.
- Nassella mucronata* (Kunth) R.W. Pohl, E.E. 16378.
- Oplismenus hirtellus* (L.) P. Beauv., E.E. 18931, 19344; J.V. 8702.
- Panicum antidotale* Retz, E.E. 19712.
- Panicum bulbosum* Kunth, J.V. 8595; TEX 83051.
- Pappophorum bicolor* E. Fourn., TEX 83527.
- Paspalum botteri* (E. Fourn.) Chase, TEX 83599.
- Paspalum conjugatum* P.J. Bergius, TEX 83626.
- Paspalum dilatatum* Poir., E.E. 14656, 14673.
- Paspalum distichum* L., TEX 83688.
- Paspalum hartwegianum* E. Fourn., TEX 83697.
- Paspalum langei* (E. Fourn.) Nash, TEX 83746, 83749, 83758, 83770.
- Paspalum pubiflorum* E. Fourn., E.E. 16169, 18977; TEX 83895, 83900.
- Paspalum unispicatum* (Scribn. & Merr.) Nash, TEX 83954.
- Piptochaetium angustifolium* (Hitchc.) Valencia & Costas, TEX 75272.
- Piptochaetium fimbriatum* (Kunth) Hitchc., E.E. 19603.
- Poa annua* L., E.E. 15971, 16503, 19569.
- Polypogon viridis* (Gouan) Breistr., E.E. 16091, 16310, 19575; TEX 142471.
- Rhynchelytrum repens* (Willd.) C.E. Hubb., E.E. 16150, 16249, 16714, 16848, 18876, 18979; G.H. 24435, 24990.
- Schizachyrium cirratum* (Hack.) Wooton & Standl. var. *cirratum*, TEX 75508.
- Setaria grisebachii* E. Fourn., E.E. 19297; TEX 75855, 75856, 75901.
- Setaria leucophylla* (Scribn. & Merr.) K. Schum., LL 170007, 170008; TEX 170004.
- Setaria parviflora* (Poir) Kerguelén, E.E. 16254, 19692, 18872, 18976, 18990; TEX 75797.
- Setaria scheelei* (Steud.) Hitchc., TEX 170115.
- Sorghastrum brunneum* Swallen, J.V. 8596; TEX 170265.
- Sorghum halepense* (L.) Pers., E.E. 16122.
- Sporobolus buckleyi* Vasey, TEX 170438.
- Sporobolus indicus* (L.) R. Br. var. *indicus*, E.E. 16192, 16624, 16778, 18868, 19098, 19122, 19178; LL 170530; TEX 170510, 170504, 170529.
- Stipa clandestina* Hack., LL 170560.
- Stipa eminens* Cav. Benth., E.E. 16287.
- Stipa leucotricha* Trin. & Rupr., TEX 170648.
- Stipa mucronata* Kunth, TEX 170669.
- Tragus berteronianus* Schult., E.E. 16722.
- Tridens muticus* (Torr.) Nash, E.E. 16686.
- Tridens texanus* (S. Watson) Nash, TEX 158168, 158169, 158173.
- Tripsacum dactyloides* (L.) L., TEX 158238.
- Potamogetonaceae**
- Potamogeton illinoensis* Morong, TEX 142176.
- Potamogeton nodosus* Poir., TEX 142189.
- Smilacaceae**
- Smilax aristolochiifolia* Mill., G.H. 25938.
- Smilax bona-nox* L., E.E. 16233, 19341; J.V. 7135; LL 177225.
- Smilax glauca* Walter, TEX 177270.
- Smilax lanceolata* L., LL 177310.
- Smilax moranensis* M. Martens & Galeotti, E.E. 19357.
- Zannichelliaceae**
- Zannichellia palustris* L., TEX 142247.
- DICOTYLEDONEAE**
- Acanthaceae**
- Anisacanthus quadrifidus* (Vahl) Nees var. *wrightii* (Torr.) Henr., LL 105860; TEX 105873; E.E. 16548; G.H. 17824.
- Beloperone fulvicoma* (Schltdl. & Cham.) A.W. Hill, TEX 88507.
- Carlowrightia parviflora* (Buckley) Wassh., TEX 87753.
- Dyschoriste poliodes* Leonard & Gentry var. *obispoensis* Henr., TEX 880012.
- Dyschoriste schiedeana* (Nees.) Kuntze var. *schiedeana* (Nees.)



Kuntze, E.E. 19680; G.H. 24360, 24415, 25450, 25611, 25914; TEX 88087.

*Elytraria bromoides* Oerst. Michx, E.E. 19690.

*Jacobinia incana* (Nees.) Hemsl., E.E. 13303; G.H. 24143, 24971; LL 88354; TEX 88332, 88335, 88348.

*Justicia pilosella* (Nees.) Hilsenb, TEX 88614.

*Justicia turneri* Hilsenb, TEX 88686, 88688.

\**Mirandea huastescensis* T.F. Daniel, TEX 88750.

*Ruellia corzoi* Tharp & Barkley, TEX 88853, 88855, 88856, 88858, 88860.

*Ruellia malacosperma* Greenm., TEX 88963, 88965, 88967.

*Ruellia nodiflora* var. *runyonii* TEX 89013.

*Ruellia occidentalis* (A. Gray) Tharp & F.A. Barkley, E.E. 16676; G.H. 24411; LL 89035; TEX 89032, 89041, 89047, 89048, 89051.

*Ruellia parryi* A. Gray, LL 89090.

*Ruellia yucatanica* (Leonard) Tharp & Barkley, TEX 89186.

*Siphonoglossa canbyi* (Greenm.) Hilsenb, TEX 89280.

*Tetramerium nervosum* Nees., E.E. 16062, 16574; G.H. 24224; TEX 89411, 89419.

#### Adoxaceae

*Sambucus nigra* L. ssp. *canadensis* (L.) R. Bolli, G.H. 24175; TEX 78104, 78105.

*Sambucus nigra* L. ssp. *cerulea* (Raf.) R. Bolli, E.E. 16512; TEX 78159, 78160, 78165.

#### Amaranthaceae

*Amaranthus palmeri* S. Watson, E.E. 16550, 16559.

*Amaranthus spinosus* L., E.E. 16198.

*Celosia nitida* Vahl, TEX 173682.

*Froelichia arizonica* Thornber ex Standl., G.H. 25902.

*Iresine calea* Standl., E.E. 13305, 16004.

*Iresine orientalis* G.L. Nesom, E.E. 16207; LL 49715; TEX 49724, 49725.

*Iresine palmeri* (S. Watson) Standl., TEX 49727, 49729, 49730, 49741.

#### Anacardiaceae

*Pistacia texana* Swingle, E.E. 18869; LL 103225; TEX 103223, 103232.

*Rhus aromatica* Aiton, LL 103289; TEX 103292, 103319, 103344.

*Rhus lanceolata* (A. Gray) Britton, TEX 103392.

*Rhus muelleri* Standl. & Barkley, E.E. 16436, 19026; G.H. 24404, 24937, 24965, 25584; TEX 103473, 103476.

*Rhus pachyrrhachis* Hemsl., TEX 103504.

*Rhus virens* A. Gray var. *virens*, G.H. 24984; LL 103813; TEX 103811, 103812, 103816.

*Rhus virens* Lindh. var. *choriophylla* (Woot. & Standl.) L.D. Benson; TEX 103776.

*Toxicodendron radicans* (L.) Kuntze ssp. *divaricatum* (Greene) Gillis, E.E. 16579, 19502; G.H. 24124, 24127; TEX 103568, 103569, 103572, 103573.

#### Apiaceae

*Apium graveolens* L., E.E. 16074.

*Apium leptophyllum* (Pers.) F. Muell., TEX 162084.

*Arracacia ternata* Mathias & Constance, TEX 162296.

*Arracacia atropurpurea* (Lehm.) Benth. & Hook. ex Hemsl., E.E. 19606.

*Cicuta maculata* L., E.E. 16124; G.H. 24406.

*Coriandrum sativum* L., E.E. 16067.

*Daucus carota* L., E.E. 16428; G.H. 24146, 24397; TEX 162462.

*Daucus montanus* Spreng, TEX 162468.

*Daucus pusillus* Michx, TEX 255245.

*Donnellsmithia ternata* (Walter) Mathias & Constance, TEX 162519.

*Eryngium longifolium* Cav., G.H. 24338.

*Eryngium venustum* Bartlett, TEX 163004.

*Hydrocotyle verticillata* Thunb., E.E. 16304.

*Prionosciadium humile* Rose, G.H. 24337; TEX 163257, 163260, 163265.

*Sanicula liberta* Cham. & Schltdl., 24137, TEX 163390.

*Tauschia bicolor* Constance & Bye., E.E. 15994.

*Torilis arvensis* (Huds.) Link, G.H. 24424.

#### Apocynaceae

*Asclepias angustifolia* Schweigg., E.E. 16575; LL 184330; TEX 184332, 184336.

*Asclepias curassavica* Griseb, G.H. 17829; TEX 184400, 184401, 184402.

*Asclepias linaria* Cav., E.E. 16319, 19487; TEX 184525, 184536.

*Asclepias mexicana* Cav., TEX 184633.

*Asclepias oenotheroides* Cham. & Schltdl., TEX 184644.

*Asclepias similis* Hemsl., E.E. 16141, 16496, 16530.

*Asclepias subverticillata* (A. Gray) Vail, TEX 184758.

*Asclepias tuberosa* L., E.E. 16629, 16481; LL 184802; TEX 184797, 184798.

*Cynanchum kunthii* (Decne.) Standl., E.E. 16318; G.H. 24347; TEX 101640.

*Cynanchum pringlei* (A. Gray) Henr., G.H. 25477.

*Cynanchum racemosum* (Jacq.) Jacq. TEX 101777.

*Marsdenia pringlei* S. Watson, E.E. 19428.

*Matelea reticulata* (Engelm. ex A. Gray) Woodson, TEX 155199, 255410.

*Sarcostemma torreyi* (A. Gray) Woodson, LL 155434; TEX 155400.

*Apocynum cannabinum* L., G.H. 24340; TEX 255246.

*Mandevilla foliosa* (Muell. Arg.) Hemsl., E.E. 14652.

*Vinca major* L., E.E. 15977; TEX 173682.

#### Aquifoliaceae

*Ilex braegeana* Loes., TEX 214669.

*Ilex rubra* S. Watson, E.E. 11806; TEX 232490.

#### Aristolochiaceae

*Aristolochia elegans* Mast, TEX 109344.

#### Asteraceae

*Achillea millefolium* L. var. *pacifica* (Rydb.) G.N. Jones, E.E. 16155, 16301; TEX 62211, 62220, 62229.

*Acmella repens* (Walter) R.K. Jansen, E.E. 13357, 16244.

*Ageratina calaminthifolia* (Kunth) R.M. King & H. Rob., G.H. 24951.

*Ageratina spinosarum* (DC.) R.M. King & H. Rob. var. *subintegrifolia* (B.L. Rob.) B.L. Turner, TEX 51616.

*Ageratina gypsophila* B.L. Turner, TEX 85918, 85919, 85920, 85921.

*Ageratina havanensis* (Kunth) R.M. King & H. Rob., G.H. 24948, 24956, 24992; LL 51768, 51781.

*Ageratina herbacea* (A. Gray) R.M. King & H. Rob., E.E. 19006.

*Ageratina nesomii* B.L. Turner, TEX 52301, 52304.

*Ageratina petiolaris* (DC.) R.M. King & H. Rob., E.E. 16022; TEX 52544.

*Ageratina pichinchensis* (Kunth) R.M. King & H. Rob., G.H. 24116; LL 52674; TEX 52672, 52677.

*Ageratina saltillensis* (B.L. Rob.) R.M. King & H. Rob., G.H. 24936; J.V. 8579; LL 52847; TEX 191163.

*Ageratina scorodonioides* (A. Gray) R.M. King & H. Rob., J.V. 8590.

*Ageratina viburnoides* (DC.) R.M. King & H. Rob. TEX 53074.

*Ageratina wrightii* (A. Gray) R.M. King & H. Rob., G.H. 24953.

*Ageratum corymbosum* Zucc., E.E. 18900; TEX 53235, 53241.

*Ambrosia artemisiifolia* L., E.E. 16429, 18969.

*Ambrosia confertiflora* DC., G.H. 24973; TEX 121102.

*Ambrosia psilostachya* DC., E.E. 16464, 16849; TEX 121520, 121522.

*Aphanostephus ramosissimus* DC. var. *ramosissimus*, E.E. 18994; G.H. 17827.

*Artemisia ludoviciana* Nutt., E.E. 19011; G.H. 24946.

*Aster ericoides* L., E.E. 18997; J.V. 8582.

*Astranthium integrifolium* (Michx.) Nutt., E.E. 15969; TEX 68086, 68084.

*Baccharis crassifolia* G.L. Nesom, LL 68365; TEX 68362.



- Baccharis neglecta* Britton, TEX 68566.  
*Baccharis salicifolia* Pers., E.E. 16733; LL 68743; TEX 68740, 68741, 68742, 68745.  
*Baccharis salicina* A. Gray, E.E. 16695, 16738.  
*Bahia absinthifolia* Benth. var. *dealbata* (A. Gray) A. Gray, TEX 55671.  
*Bahia autumnalis* W.L. Ellison, G.H. 24987, 25900; J.V. 8568; TEX 55697, 55708.  
*Bidens aurea* Sherff, TEX 122066.  
*Bidens odorata* Cav., E.E. 16058, 16605, 18936, 19001.  
*Brickellia eupatorioides* (L.) Shinnars var. *chlorolepis* (Wooton & Standl.) B.L. Turner, G.H. 24939.  
*Brickellia grandiflora* (Hook.) Nutt., E.E. 19022; J.V. 8591; TEX 114182, 114192, 114194, 191162.  
*Brickellia laciniata* A. Gray, E.E. 11298, 11304; G.H. 24942.  
*Brickellia lemmonii* A. Gray, var. *nelsonii* (B.L. Rob.) B.L. Turner, E.E. 11286; G.H. 25920; TEX 114393, 114395, 114400, 114401.  
*Brickellia secundiflora* A. Gray var. *parryi* (A. Gray) B.L. Turner, 1989, G.H. 25579.  
*Brickellia veronicifolia* (Kunth) A. Gray, G.H. 24938, 24945; TEX 114930, 114971.  
*\*Cacalia sundbergii* B.L. Turner, E.E. 19350.  
*Calea ternifolia* Oliv. var. *calyculata* (Kunth) Wussow, J.V. 8678; TEX 123123.  
*Calypocarpus vialis* Less., E.E. 16188, 16196, 19345; G.H. 24354; TEX 123396, 123408, 123418, 123418, 123422, 123423.  
*Carduus tenuiflorus* Curtis, G.H. 24105.  
*Centaurea americana* Nutt., E.E. 16184; TEX 64265, 64266.  
*Chaetopappa bellioides* (A. Gray) Shinnars, TEX 69240, 69244, 69250, 69254.  
*Chaptalia lyratifolia* Burkart, G.H. 25927.  
*Chaptalia texana* Greene, E.E. 11292, 19103; G.H. 25570; TEX 66381, 66389, 66399.  
*Chaptalia transiliens* G.L. Nesom, J.V. 8562.  
*Chromolaena odorata* (L.) R.M. King & H. Rob., E.E. 16214; J.V. 8697; LL 115456, 115457; TEX 115448, 115455.  
*Chrysactinia mexicana* A. Gray, E.E. 16099, 19485; TEX 56051.  
*Chrysactinia pinnata* S. Watson, TEX 56104, 56109, 56113.  
*Chrysactinia truncata* S. Watson, E.E. 16478, 19277; G.H. 24369; LL 56127; TEX 56130, 56132, 56133, 56134, 306063.  
*Chrysanthemum leucanthemum* L., J.V. 7105; TEX 62467, 62468.  
*Chrysanthemum parthenium* (L.) Pers., E.E. 16064, 16162, 16620.  
*Chrysanthemum procumbens* (L.) Sessé & Moc. TEX 133247.  
*Cirsium acrolepis* (Petr.) G.B. Ownbey, G.H. 24229.  
*Cirsium pringlei* (S. Watson) Petr., E.E. 14684, 16298; G.H. 24339.  
*Cirsium texanum* Buckley, G.H. 24235.  
*Conoclinium betonicifolium* (Mill.) R.M. King & H. Rob. var. *integrifolium* (A. Gray) Patt., TEX 115811, 115820.  
*Conyza canadensis* var. *canadensis* (L.) Cronquist, E.E. 14854, 16749a, 18984; TEX 69584, 69608.  
*Cosmos bipinnatus* Cav., E.E. 19007.  
*Cosmos crithmifolius* Kunth TEX 123979, 123980, 123981.  
*Dahlia coccinea* Cav., E.E. 16562, 19035; TEX 124384, 124390.  
*Dahlia tubulata* P.D. Sorensen, LL 136829; TEX 136833.  
*Dichaetophora campestris* A. Gray, TEX 70037, 70041.  
*Dyssodia papposa* Hitchc., G.H. 25574, 25575.  
*Dyssodia pinnata* B.L. Rob., E.E. 11288, 16149, 16416, 16850, 18862, 19279.  
*Dyssodia pinnata* B.L. Rob. var. *glabrescens* Strother, G.H. 24353, 24943.  
*Erigeron basilobatus* S.F. Blake, E.E. 16289, 16297; TEX 70153, 70154, 70155.  
*Erigeron calcicola* Greenm., G.H. 24949, 25460; LL 70256; TEX 70264.  
*Erigeron dryophyllus* A. Gray, J.V. 7118; TEX 70527, 70532, 70533, 98262.  
*Erigeron metrius* S.F. Blake, G.H. 24118, LL 137168; TEX 137170, 137171.  
*Erigeron veracruzensis* G.L. Nesom LL 71049, 71050; TEX 71051, 71053, 71057, 71058.  
*Evax verna* Raf., TEX 139453, 139459.  
*Flaveria trinervia* (Spreng.) C. Mohr, TEX 56808.  
*Fleischmannia porphyranthema* (A. Gray) R.M. King & H. Rob, TEX 116453, 116457, 116458, 116469.  
*Fleischmannia pycnocephala* (Less.) R.M. King & H. Rob, E.E. 19250; TEX 191169.  
*Florestina triperis* DC., E.E. 16677.  
*Flourensia cernua* DC., E.E. 18745.  
*Flourensia monticola* M.O. Dillon, G.H. 24950; TEX 125157, 125158, 125162, 125165.  
*\*Flyriella leonensis* (B.L. Rob.) R.M. King & H. Rob., E.E. 16300; J.V. 7117; LL 116730, 116733; TEX 116731, 167132, 116734, 116735, 116736.  
*Gaillardia mexicana* A. Gray, E.E. 16459, 11306; J.V. 8578; TEX 57249, 57256, 57251, 191164.  
*Gaillardia pulchella* Foug., E.E. 16012.  
*Gamocheta americana* (Mill.) Cabrera, TEX 139489.  
*Gnapahliopsis micropoides* DC., TEX 58260, 58292.  
*Gnaphalium brachypterum* DC., G.H. 25473, 25921, 25945.  
*Gnaphalium semiamplexicaule* DC., E.E. 16191.  
*Gochnatia hypoleuca* (DC.) A. Gray, E.E. 19476; TEX 66489.  
*Greenmaniella resinosa* (S. Watson) W.M. Sharp, TEX 125462, 125466, 125467, 125470 125473, 125476, 306201.  
*Grindelia greenmanii* Steyer., G.H. 24957.  
*Grindelia tenella* Steyer., TEX 136693, 136696.  
*Gutierrezia microcephala* (DC.) A. Gray, LL 71378; TEX 71384.  
*Gutierrezia sarothrae* (Pursh) Britton & Rusby, G.H. 25919; TEX 71447.  
*Gutierrezia texana* (DC.) Torr. & A. Gray var. *glutinosa* (S. Schauer) M.A. Lane, TEX 71549, 71554, 71560, 71566, 71570.  
*Gymnosperma glutinosa* Less., E.E. 11283, 16081, 18999, 19270; G.H. 25476; TEX 71783 71794, 71800, 71802, 71805, 71809.  
*Haploesthes greggii* A. Gray var. *multiflora* I.M. Johnst., LL 57488; TEX 57489.  
*Helenium elegans* DC. var. *amphibolum* (A. Gray) Bierner, LL 57553; TEX 57537, 57538, 57551.  
*Helenium microcephalum* DC. var. *ooclinium* (A. Gray) Bierner, E.E. 16210, 16549, 16667; G.H. 24106, 24172.  
*Helianthus annuus* L., G.H. 24169, TEX 125724.  
*Helianthus hirsutus* Raf., LL 125762, TEX 125756.  
*Helianthus laciniatus* A. Gray, E.E. 14703, 14710.  
*Heliopsis parvifolia* A. Gray, G.H. 24935, 25909.  
*Heterotheca mucronata* Harms ex B.L. Turner, E.E. 16317, 16684; TEX 71972, 71985, 71992, 86351.  
*Heterotheca subaxillaris* (Lam.) Britton & Rusby, E.E. 14838, 14876, 16148; 16154, 16753, 18863, 18871; G.H. 24426, 24986; LL 136421; TEX 136418, 136419, 136422, 136423, 136440.  
*Hieracium abscissum* Lees., E.E. 16537; LL 64776; TEX 64774, 64788.  
*Hieracium crepidispermum* Fries, G.H. 25569.  
*Hieracium gypsophilum* B.L. Turner, G.H. 25491; TEX 64973, 64978, 64989.  
*Hymenoxys linearifolia* Hook., E.E. 16060.  
*Hymenoxys scaposa* (DC.) Parker, E.E. 16014.  
*Iva ambrosiifolia* (A. Gray) A. Gray, TEX 126384.  
*Jefea brevifolia* (A. Gray) Strother, G.H. 25908.  
*Koanophyllon longifolium* (B.L. Rob.) R.M. King & H. Rob., J.V. 8593, 8668; TEX 117192.  
*Koanophyllon reyrobinsonii* B.L. Turner, TEX 117055, 117057, 117065, 191155.  
*Lactuca ludoviciana* (Nutt.) Riddell, E.E. 16175, 16346; LL 65132; TEX 65125, 65130, 65135.



- Lactuca sativa* L., E.E. 16076.  
*Laennecia schiedeana* (Less.) G.L.Nesom, TEX 69916.  
*Laennecia sophiifolia* (Kunth) G.L.Nesom, TEX 69975, 69976, 69977.  
*Machaeranthera pinnatifida* (Hook.) Shinnars var. *pinnatifida*, G.H. 24428.  
*Machaeranthera tanacetifolia* (Kunth) Nees, J.V. 1253.  
*Matricaria chamomilla* L., E.E. 16065.  
*Melampodium divaricatum* (Rich) DC., E.E. 16647, 19403.  
*Osbertia bartletti* (S.F. Blake) G.L. Nesom, TEX 138631.  
*Palafoxia texana* DC. var. *texana* DC., TEX 59294, 59295.  
*Parthenium confertum* A. Gray, E.E. 16660.  
*Parthenium confertum* A. Gray var. *lyratum* (A. Gray) Rollins, TEX 129617.  
*Parthenium hysterophorus* L., E.E. 15968, 16698; TEX 129738, 129742.  
*\*Parthenium lozanianum* Bartlett, TEX 373935.  
*Peteravenia malvaefolia* (DC.) R.M. King & H. Rob., TEX 117656, 117657, 117658, 117665.  
*Pinaropappus roseus* (Less.) Less. var. *macvaughii*, TEX 65367, 65376, 65385.  
*Piqueria trinervia* Cav., TEX 117863.  
*Pluchea carolinensis* (Mill.) Gillis, G.H. 17832; LL 141593; TEX 141592, 141594, 141595.  
*Porophyllum amplexicaule* Engelm ex A. Gray, G.H. 22155.  
*Porophyllum scoparium* A. Gray, E.E. 19506; G.H. 17825, 24989, 25475; LL 60639; TEX 60638.  
*Psacaliu peltatum* (Kunth) Cass. var. *adenophorum* S.F. Blake, TEX 86015, 86021.  
*Pseudognaphalium austrotexanum* G.L.Nesom, TEX 139783.  
*Pseudognaphalium brachypterum* (DC.) Anderb., TEX 139822, 139823.  
*Pseudognaphalium canescens* (DC.) Anderb., TEX 139852.  
*Pseudognaphalium roseum* (Kunth) Anderb., TEX 141284.  
*Pseudognaphalium viscosum* (Kunth) Anderb. LL 141507.  
*Psilactis tenuis* S. Watson, E.E. 16635; LL 138891, TEX 138889.  
*Psilostrophe gnaphalodes* DC., TEX 60791.  
*Pyrrhopappus pauciflorus* (D. Don) DC., E.E. 15954; G.H. 24107; LL 65556.  
*Ratibida columnifera* (Nutt.) Wooton & Standl., E.E. 14640, 16106, 16400.  
*Roldana sundbergii* (B.L. Turner) B.L. Turner, LL 62998; TEX 62995.  
*Rumfordia alcortae* Rzed., TEX 130643.  
*\*Rumfordia exauriculata* B.L. Turner, TEX 130656.  
*\*Sabazia mullerae* S.F. Blake, TEX 373978.  
*Sanvitalia ocymoides* DC., E.E. 16680.  
*Schkuhria pinnata* (Lam.) Kuntze ex Thell. var. *guatemalensis* (Rydb.) McVaugh, G.H. 25573.  
*Sclerocarpus uniserialis* Benth. & Hook. F. var. *frutescens* (Brandegee) Feddema, E.E. 16144, 16427, 18893, 18998; TEX 131399, 131401, 131406.  
*Senecio coahuilensis* Greenm., E.E. 13308, 13373, 14672, 15960, 16288, 16307; TEX 63800, 63822, 63830.  
*Senecio loratifolius* Greenm., TEX 64086.  
*Senecio madrensis* A. Gray, TEX 64124, 64133.  
*Senecio montereyanus* S. Watson, E.E. 16357; J.V. 7110; TEX 63865, 63867.  
*\*Senecio pattersonii* B.L. Turner, TEX 31160.  
*Senecio platypus* Greenm., J.V. 8587; TEX 191163.  
*Senecio richardsonii* B.L. Turner, TEX 63738, 63746.  
*Senecio salignus* DC., E.E. 16019, 19499; TEX 63324, 63326.  
*Senecio tampicanus* DC. E.E. 16449.  
*Senecio vulgaris* L., TEX 63660.  
*Simsia amplexicaulis* (Cav.) Pers., G.H. 25578; TEX 131749, 131751.  
*Simsia calva* (A. Gray & Engelm) A. Gray, E.E. 11362, 14877.  
*Simsia eurylepis* S.F. Blake, TEX 131891.  
*Smallanthus uvedalius* (L.) Mack. ex Small, E.E. 19294; TEX 54471, 132117.  
*Solidago altissima* L., E.E. 16646; TEX 138898.  
*Solidago hintoniorum* G.L. Nesom, E.E. 16431; TEX 138936.  
*Solidago juliae* G.L. Nesom, LL 138943.  
*Solidago pringlei* Fernald, TEX 138977, 138978.  
*Sonchus oleraceus* L., E.E. 16057, 16173, 16407, 16841, 18937.  
*Stevia berlandieri* A. Gray var. *berlandieri*, E.E. 14625, 14702, 15200, 16131, 16529; G.H. 24162; LL 120167, 120168; TEX 120161, 120163, 120169, 120170, 120190, 120191, 120205.  
*Stevia ovata* Willd., E.E. 18965, 19148; J.V. 8569, 8667.  
*Stevia pilosa* Lag., TEX 119561.  
*Stevia porphyrea* McVaugh, LL 119527.  
*Stevia salicifolia* Cav. var. *salicifolia*, TEX 119793.  
*Symphotrichum carnerosanum* (S. Watson) G.L. Nesom, G.H. 24941, LL 67557; TEX 67561, 67562, 67563.  
*Symphotrichum expansum* (Poepp. ex Spreng.) G.L. Nesom, TEX 67638, 67639, 67652.  
*Tagetes lucida* Cav., E.E. 11309a, 16098, 16365, 16492a, 19003; LL 61537.  
*Tamaulipa azurea* (DC.) R.M. King & H. Rob., TEX 118130, 118142, 118144, 118149.  
*Taraxacum officinale* F.H. Wigg., E.E. 15953, 16426.  
*Tetraneuris linearifolia* Greene var. *linearifolia*, G.H. 24335; TEX 58941, 58943, 58944, 58948, 58967.  
*Tetraneuris scaposa* Greene var. *scaposa*, G.H. 25925.  
*Thelesperma longipes* A. Gray, G.H. 25937.  
*Thelesperma megapotamicum* (Spreng.) Kuntze var. *megapotamicum*, G.H. 25456.  
*Thelesperma subaequale* S.F. Blake, G.H. 25947; TEX 85679.  
*Thymophylla acerosa* (DC.) Strother, E.E. 13245.  
*Thymophylla pentachaeta* (DC.) Small var. *pentachaeta*, E.E. 13366, 16696; G.H. 24348; TEX 58660, 58674, 58690, 58695, 58714.  
*Thymophylla setifolia* Lag., TEX 58238.  
*Tridax coronopifolia* (Kunth) Hemsl., TEX 132940.  
*Trixis inula* Crantz, TEX 66807.  
*Verbesina chihuahuensis* A. Gray, TEX 133862.  
*Verbesina coahuilensis* A. Gray ex S. Watson, G.H. 24367; TEX 134437, 134438, 134440, 134442, 134443.  
*Verbesina daviesiae* B.L. Turner, TEX 134053, 134055.  
*Verbesina encelioides* (Cav.) Benth. & Hook. ex A. Gray, G.H. 22184, 24995.  
*Verbesina hypomalaca* B.L. Rob. & Greenm. var. *saltillensis* B.L. Turner, G.H. 25455.  
*Verbesina longipes* Hemsl., G.H. 25464; J.V. 8580.  
*Verbesina microptera* DC., G.H. 24962.  
*Verbesina mollis* Kunth, J.V. 8581; TEX 134394, 184227.  
*\*Verbesina olsenii* B.L. Turner, E.E. 16756; TEX 134874, 134876, 134879, 134882.  
*Verbesina persicifolia* DC., G.H. 24991; J.V. 8699; LL 134685; TEX 134686, 134692, 134693.  
*\*Verbesina zaragozana* B.L. Turner, TEX 134362.  
*Vernonia greggii* A. Gray var. *greggii*, E.E. 14631, 16428.  
*Vernonia greggii* A. Gray var. *ervendergii* (A. Gray) B.L. Turner, G.H. 24114, 24117; J.V. 8666; LL 50309, 50311; TEX 50294, 50295, 50297, 50303, 50305, 50616.  
*\*Vigethia mexicana* (S. Watson) Weber, E.E. 15950; G.H. 24104, 24131; LL 135091, 135097; TEX 135088, 135096, 135099, 135108, 135109, 135110, 135115, 135117.  
*Viguiera adenophylla* S.F. Blake, J.V. 8682; TEX 135350, 135351, 135360.  
*Viguiera cordifolia* A. Gray var. *latisquama* Greenm., G.H. 25465.  
*Viguiera dentata* (Cav.) Spreng var. *dentata*, TEX 135507.  
*Wedelia acapulcensis* Kunth var. *hispida* (Kunth) J.L. Strother, E.E.



14624, 14852, 18913; G.H. 24359; TEX 54150, 54207.

*Wedelia ayerscottiana* B.L. Turner, G.H. 25472; TEX 54101.

*Zaluzania megacephala* Sch. Bip., LL 54473, TEX 54471.

*Wyethia mexicana* S. Watson, TEX 374131.

*Zinnia peruviana* (L.) L., E.E. 16411, 16743, 16839; G.H. 24431.

#### Balsaminaceae

*Impatiens capensis* Meerb., E.E. 16120; G.H. 25468; TEX 264705.

#### Basellaceae

*Anredera scandens* (L.) Moq., E.E. 16158, 16618; TEX 258823, 258825, 258838.

#### Begoniaceae

*Begonia uniflora* S. Watson, E.E. 19079, 19353; J.V. 8683; TEX 181761, 181765, 181772.

#### Berberidaceae

*Berberis eutriphylla* (Fedde) C.H. Muller TEX 240894;

*Berberis gracilis* Benth. var. *madrensis* Marroq., E.E. 16322, 19259, 19599; TEX 240918, 240922, 240925, 240931.

*Berberis trifoliolata* Moric, E.E. 19484; TEX 247023.

#### Betulaceae

*Carpinus caroliniana* Walter, TEX 171665.

*Ostrya virginiana* (Mill.) K. Koch, ssp. *virginiana* K. Koch, E.E. 16460, 19163; TEX 171736, 171738.

#### Bignoniaceae

*Chilopsis linearis* (Cav.) Sweet var. *tomenticaulis* Henr., E.E. 16151.

*Tecoma stans* (L.) Juss. ex Kunth, E.E. 16123, 16792; G.H. 24968; TEX 104857, 104918, 104941.

#### Boraginaceae

*Cordia boissieri* A. DC., E.E. 16712; LL 224208, 224222; TEX 224197, 224203, 224209.

*Cryptantha mexicana* (Brandeggee) I.M. Johnst, LL 224939; TEX 224931.

*Ehretia anacua* (Teran & Berla.) I.M. Johnst., E.E. 19694; TEX 225039, 225055.

*Heliotropium angiospermum* Murray, LL 225146, 225177, 306824; TEX 225145, 225148;

*Heliotropium calcicola* Fernald, G.H. 22186.

*Heliotropium confertifolium* (Torr.) A. Gray, TEX 225282.

*Heliotropium fruticosum* L., G.H. 24452.

*Heliotropium glabriusculum* (Torr.) A. Gray, TEX 225457.

*Heliotropium procumbens* Mill., E.E. 16672.

*Heliotropium torreyi* I.M. Johnst., G.H. 17831; TEX 225731, 225736, 225737, 225740.

*Lithospermum calcicola* B.L. Rob., G.H. 25582, 25932; TEX 225833.

*Lithospermum calycosum* (J.F. Macbr) I.M. Johnst., TEX 255136.

*Lithospermum distichum* Ortega, G.H. 24376.

*Lithospermum mirabile* Small, TEX 225966.

\**Lithospermum nelsonii* Greenm., TEX 223064, 225982.

*Lithospermum palmeri* S. Watson, G.H. 24393.

*Lithospermum viride* Greene, LL223060; TEX 223054, 223062, 223053.

*Macromeria barbiger* I.M. Johnst., LL 192103; TEX 192101.

*Macromeria leonitis* I.M. Johnst., E.E. 19613.

*Omphalodes cardiophylla* A. Gray ex Hemsl., E.E. 16782, 19081; G.H. 24342, 24454, 25906; TEX 223079, 223084.

*Omphalodes mexicana* S. Watson, E.E. 18942.

\**Onosmodium dodrantale* I.M. Johnst., J.V. 8564.

*Tiquilia canescens* (DC.) A.T. Richardson, E.E. 21324.

#### Brassicaceae

*Brassica campestris* L., E.E. 16089; TEX 147742.

*Brassica juncea* (L.) Czern., TEX 147721.

*Brassica nigra* W.D.J. Koch, TEX 147726.

*Brassica rapa* L., TEX 147742.

\**Cardamine auriculata* S. Watson, LL 147809; TEX 147786, 147792, 147796, 147801, 147802, 147803, 147805, 147807.

*Cardamine macrocarpa* Braegee, E.E. 19467; TEX 147820, 147816.

*Diploaxis muralis* (L.) DC., E.E. 16413.

*Eruca sativa* Mill., E.E. 16010; TEX 148091.

*Erysimum asperrimum* (Greene) Rydb., G.H. 24344; LL 148121; TEX 148112, 148115, 148108.

*Erysimum asperrimum* DC., E.E. 15992.

*Erysimum capitatum* (Douglas ex Hook.) Greene, E.E. 14882.

*Lepidium austrinum* Small, TEX 148243, 148245.

*Lepidium lasiocarpum* Nutt., E.E. 15967; LL 148222.

*Lepidium virginicum* L. var. *pubescens* (Greene) C.L. Hitchc., E.E. 16430; TEX 148341.

*Lesquerella inflata* Rollins & E.A. Shaw, TEX 148551.

*Lesquerella lasiocarpa* (A. Gray) S. Watson, E.E. 19327.

*Lunaria annua* L., E.E. 14628, 16140, 18897, 18934.

*Lunaria rediviva* L., E.E. 16002.

*Physaria mirandiana* (Rollins) O'Kane & Al-Shehbaz, E.E. 16392.

*Rorippa mexicana* (Moc., Sessé & Cerv. D.C.) Standl. & Steyer, E.E. 16501, 16780.

*Rorippa nasturtium-aquaticum* (L.) Schinz & Thell., E.E. 16539, 16787, 18932; TEX 148581, 149085, 149086.

*Sisymbrium auriculatum* A. Gray, E.E. 13318.

*Sisymbrium longipes* Rollins, TEX 371009.

*Sisymbrium irio* L., E.E. 18970, 18980.

*Synthlipsis greggii* A. Gray, LL 149313.

*Thelypodium longipes* (Rollins) Rollins, E.E. 16741.

#### Cactaceae

*Cylindropuntia imbricata* (Haw.) F.M. Knuth., E.E. 19619.

*Cylindropuntia leptocaulis* (DC.) F.M. Knuth, E.E. 12654.

*Echinocereus enneacanthus* Engelm., E.E. 19626.

*Echinocereus pentalophus* (DC.) Lem. ssp. *leonensis* (Mathsson) N.P. Taylor, TEX 181897.

*Echinocereus reichenbachii* (Terscheck) Britton & Rose, E.E. 19628, 19631.

*Echinocereus stramineus* (Engelm.) Rumpler, E.E. 19632.

\**Echinocereus viereckii* Werderm ssp. *morricallii* (Riha) N.P. Taylor, TEX 181913, 181914.

*Epithelantha micromeris* (Engelm.) F.A.C. Weber ex Britton & Rose, TEX 181947.

*Ferocactus hamatacanthus* (Muehlenpf.) Britton & Rose, E.E. 19629.

*Ferocactus pilosus* (Galeotti) Werderm., E.E. 19505.

*Mammillaria chionocephala* J.A. Purpus, E.E. 19625.

*Mammillaria melanocentra* Poselger, TEX 271027.

*Mammillaria prolifera* (Mill.) Haw. ssp. *texana* (Engelm.) D.R. Hunt., E.E. 19627.

*Mammillaria winterae* Boed., E.E. 19630.

*Neolloydia conoidea* (DC.) Britton & Rose, E.E. 19624.

*Opuntia lindheimeri* Engelm., E.E. 19618, 19621, 19639.

*Opuntia microdasys* (Lehm.) Pfeiff., E.E. 19622.

*Opuntia stenopetala* Engelm., E.E. 19617.

*Selenicereus spinulosus* (DC.) Britton & Rose, E.E. 16522.

*Thelocactus bicolor* (Galeotti ex Pfeiff.) Britton & Rose, TEX 271371.

*Turbinicarpus beguinii* (N.P. Taylor) Mosco & Zanovello ssp. *beguinii* (N.P. Taylor) Mosco & Zanovello, G.H. 27208, 27828.

#### Campanulaceae

*Campanula rotundifolia* L., E.E. 16444.

*Lobelia calcaria* E. Wimm., TEX 80118.

*Lobelia cardinalis* L., E.E. 16168; TEX 80137, 80141, 80143, 80146, 80147.

\**Lobelia sublibera* S. Watson, E.E. 16369, 16551; G.H. 24129, 24234; TEX 80519, 80521, 80522, 80523, 80544.



*Triodanis coloradoensis* (Buckley) McVaugh, TEX 80604.

**Caparaceae**

*Koeberlinia spinosa* Zucc., E.E. 19482.  
*Polanisia dodecandra* (L.) DC., TEX 149928.

*Polanisia uniglandulosa* DC., E.E. 14883, 16121, 16394; G.H. 24429, 24974; TEX 149906.

**Caprifoliaceae**

*Abelia coriacea* Hemsl. var. *subcoriacea* Villarreal., TEX 245831, 245833.  
*Lonicera japonica* Thunb., E.E. 16044.  
*Lonicera pilosa* (Kunth) Willd., E.E. 16344.  
*Symphoricarpus microphyllus* Kunth, TEX 78256.  
*Symphoricarpus orbiculatus* Moench, LL 78258.

**Caryophyllaceae**

*Arenaria benthamii* Fenzl ex Torr. & A. Gray, TEX 239096.  
*Arenaria lanuginosa* Rohrb. var. *saxosa* (A. Gray) B.L. Turner, E.E. 16312, 16316, 16487; TEX 258961.  
*Arenaria lycopodioides* Willd. ex Schltdl., E.E. 13339.  
*Drymaria barkleyi* Duke & Steyer., TEX 239270.  
*Drymaria glandulosa* Bartl., TEX 239450.  
*Drymaria laxiflora* Benth., LL 239365; TEX 239364.  
*Saponaria officinalis* L., G.H. 24341; TEX 256067.  
*Silene laciniata* (A. Gray) Hitchc., E.E. 16109, 16178, 16306, 16746, 18934a.  
*Silene laciniata* Cav. var. *greggii* (A. Gray) S. Watson, E.E. 16109, 16178, 16306, 16746, 18934a; LL 239569; TEX 239562, 239563, 239565.  
*Stellaria cuspidata* Willd., E.E. 13298, 13367; G.H. 24112; LL 239689; TEX 239675, 239693, 239694, 239696, 239698, 239705.

**Celastraceae**

*Mortonia greggii* A. Gray, E.E. 19478.

**Celtidaceae**

*Celtis laevigata* Willd., E.E. 14858, 16220; G.H. 24969.  
*Celtis pallida* Torr., E.E. 16659, 16729, 19101; TEX 216646.

**Chenopodiaceae**

*Beta vulgaris* L., E.E. 16078.  
*Chenopodium ambrosioides* L., E.E. 16072, 16156, 16362, 16611; TEX 173020.  
*Chenopodium berlandieri* Moq., E.E. 18935, 18983.  
*Chenopodium graveolens* Willd., E.E. 16610, 16622.  
*Chenopodium incidium* Poir., E.E. 16554.  
*Chenopodium murale* L., TEX 173151.

**Clusiaceae**

*Hypericum formosum* Kunth, E.E. 16552.

**Convolvulaceae**

*Convolvulus equitans* Benth., G.H. 24214, 24427.  
*Cuscuta glabrior* (Engelm.) Yunck., TEX 155643.  
*Cuscuta indecora* Choisy, E.E. 16691; TEX 155654.  
*Cuscuta mitriformis* Engelm., TEX 155714, 155715.  
*Cuscuta rugosiceps* Yunck., TEX 155750.  
*Cuscuta tinctoria* Mart. ex Engelm., TEX 155774.  
*Dichondra micrantha* Urb., TEX 155938.  
*Dichondra sericea* Sw., E.E. 16235, 16494, 16524; TEX 155943.  
*Evolvulus alsinodes* Kuntze, E.E. 16697, 16724; TEX 155986.  
*Ipomoea cristulata* Hallier, E.E. 16423.  
*Ipomoea hederifolia* L., TEX 242611.  
*Ipomoea nil* (L.) Roth, TEX 242871.  
*Ipomoea orizabensis* J.A. McDonald var. *collina* (House), TEX 217423.  
*Ipomoea purpurea* Roth., E.E. 19102.  
*Ipomoea simulans* D. Hanb, LL 217236; TEX 217234, 217235.

**Cornaceae**

*Cornus florida* L., ssp. *urbiniana* (Rose) Rickett., E.E. 15403, 15460, 15981, 16007, 16017, 16479; J.V. 7106, LL 163718, 163724, 163726, 163733; TEX 163722, 163734, 163782; TEX 163782.

**Crassulaceae**

*Echeveria simulans* Rose, LL 168239; TEX 168235, 168240.  
*Echeveria strictiflora* A. Gray, E.E. 13358.  
*Kalanchoe daigremontiana* (Raym.) Hamet & Perrier, E.E. 16704.  
*Lenophyllum acutifolium* Rose, TEX 168301.  
*Sedum calcicola* B.L. Rob. & Greenm., TEX 168343.  
*Sedum diffusum* S. Watson, LL 168387; TEX 168389, 168391.  
*Sedum palmeri* S. Watson, E.E. 13299, 15996, 19438, 19457; TEX 168568, 168570, 168576, 168577.  
*Sedum papillicaule* G.L. Nesom, E.E. 16519.  
*Sedum rhodocarpum* Rose, TEX 168624.  
*Sedum wrightii* A. Gray, TEX 168675.  
*Villadia squamulosa* (S. Watson) Rose., E.E. 19144, 19252.

**Cucurbitaceae**

*Cucurbita foetidissima* Kunth, E.E. 16398.  
*Cyclanthera dissecta* (Torr. & A. Gray) Arn. & Hook., E.E. 18907, 18939; TEX 79157.  
*Melothria pendula* L., E.E. 16266; TEX 79469, 79477, 79479.  
*Sechium edule* (Jacq.) Sw., E.E. 18967.

**Ebenaceae**

*Diospyros texana* Scheele, E.E. 16252.

**Ericaceae**

*Arbutus xalapensis* Kunth, G.H. 24947; LL 276212; TEX 276100.  
*Arctostaphylos pungens* Kunth, TEX 276393.  
*Chimaphila umbellata* (L.) Nutt., TEX 154450.  
*Comarostaphylis polifolia* (Kunth) Zucc., E.E. 19515, 19541.  
*Leucothoe mexicana* (Hemsl.) Small, E.E. 15452.  
*Lyonia squamulosa* M. Martens & Galeotti, LL 276862; TEX 276860, 276863.  
*Monotropa hypopithys* L., E.E. 19640.  
*Vaccinium kunthianum* Klotzsch, LL 277017; TEX 277015.

**Euphorbiaceae**

*Acalypha dioica* S. Watson, G.H. 24944, 25907; LL 215443; TEX 215442, 215446, 215448.  
*Acalypha lindheimeri* Müll. Arg., E.E. 16080, 16421, 15965, 16613; G.H. 25583.  
*Acalypha ostryifolia* Riddell, TEX 215144.  
*Acalypha phleoides* Cav., E.E. 16728; TEX 215269, 215270, 215271; TEX 215025, 215031, 215050.  
*Argythamnia astroplethes* J.W. Ingram, TEX 90142.  
*Argythamnia neomexicana* Müll. Arg., TEX 90225.  
*Bernardia myricaefolia* (Scheele) S. Watson, E.E. 16206.  
*Cnidoscolus rotuifolius* (Müll. Arg.) McVaugh, TEX 91872, 91873.  
*Croton ciliatoglandulifer* Ortega, E.E. 13363, 14836, 15964, 16102, 16238, 19095, 19236; G.H. 24098; LL 92163; TEX 92170, 92078, 92079, 92103, 92181, 92182, 92183.  
*Croton dioicus* Cav., TEX 92439.  
*Croton fruticulosus* Torr., E.E. 16528, 16553, 16737, 16795, 18880, 19393, 19591, 19705; G.H. 24358; LL 92566; TEX 92552, 92558, 92582, 92591.  
*Croton incanus* Kunth, E.E. 16576; TEX 92740.  
*Croton suaveolens* Torr., LL 93170, 93222; TEX 93220, 93220.  
*Euphorbia antisiphilitica* Zucc., E.E. 19477; TEX 93450.  
*Euphorbia campestris* Cham. & Schltdl., G.H. 25944; TEX 94519, 94522, 94523, 94524, 94526.  
*Euphorbia cumbrae* Boiss., TEX 90633.  
*Euphorbia cyathophora* Murray, TEX 94183.  
*Euphorbia dentata* Michx., E.E. 16564, 16750; TEX 94267, 94268.



- Euphorbia fendleri* (Torr.) A. Gray, E.E. 16678, 16720.  
*Euphorbia furcillata* Kunth, E.E. 15462, 15980, 19394, 19567; G.H. 24139.  
*Euphorbia graminea* Jacq., J.V. 8588, TEX 93634.  
*Euphorbia greggii* Engelm. ex Boiss., G.H. 25571, 25612, 25928, 25929; TEX 94599, 94600, 94601, 94602, 94603, 94604.  
*Euphorbia helleri* Millsp., TEX 94620.  
*Euphorbia heterophylla* L. f. *cyathophora* (Murray) Voss, TEX 94183.  
*Euphorbia hyssopifolia* L., E.E. 16693, 18867.  
*Euphorbia lathyris* L., TEX 94624.  
*Euphorbia macropus* (Klotzsch & Garke) Boiss, TEX 93838.  
*Euphorbia macropus* (Kl. et Gke.) Boiss. var. *novoleonensis* Mayfield, G.H. 25467; TEX 93835.  
*Euphorbia mcvaughiana* M.C. Johnst., TEX 94627.  
*Euphorbia montereyana* Millsp., TEX 93920, 93921, 93923, 93934, 93938.  
*Euphorbia nutans* Lag., TEX 91090, 91083, 91085.  
*Euphorbia prostrata* Aiton, E.E. 16612, 16666, 16796.  
*Euphorbia serpens* Kunth, TEX 91263.  
*Euphorbia stictospora* Engelm., TEX 91465.  
*Euphorbia villifera* Scheele, LL 91674; TEX 91660.  
*Gymnanthes longipes* Müll. Arg., TEX 94786.  
*Jatropha dioica* Sessé ex. Cerv., E.E. 16684; TEX 94949.  
*Phyllanthus neoleonensis* Croizat, LL 102373; TEX 253918, 253978.  
*Phyllanthus polygonoides* Nutt. ex Spreng., E.E. 18921; J.V. 8665, LL 102429; TEX 102418, 102419, 253970.  
*Ricinus communis* L., E.E. 16064a, 19385; TEX 102548.  
*Stillingia sanguinolenta* Müll. Arg., G.H. 24955, TEX 102730, 102731, 102734, 102735, 102736.  
*Stillingia treculiana* (Müll. Arg.) I.M. Johnst., TEX 102787.  
*Tragia nepetaefolia* Cav., G.H. 25474.
- Fabaceae**  
*Acacia berlandieri* Benth., E.E. 15198, 16203; G.H. 24430; TEX 152704, 152712.  
*Acacia coulteri* Benth., E.E. 13328, 13350, 13387, 14897, 16215, 16561; G.H. 24102, 24235; TEX 152993, 253505.  
*Acacia farnesiana* (L.) Willd., E.E. 13331, 16706, 19370, TEX 153072.  
*Acacia rigidula* Benth., E.E. 13333; G.H. 24982.  
*Acacia roemeriana* Scheele, E.E. 12745, 13352; TEX 153621.  
*Acacia wrightii* Benth. ex A. Gray, TEX 153701.  
*Acaciella angustissima* (Mill.) Kuntze var. *angustissima* (Mill.) Kuntze, E.E. 13327, 14830, 14844, 14880, 14895, 18864, 19002; G.H. 24103; LL 152574; TEX 152571.  
*Acaciella villosa* Willd., E.E. 14711, 16432.  
*Amicia zygomeris* DC., E.E. 19461; TEX 191879.  
*Astragalus austrinus* (Small) Schulz var. *austrinus* (Small) Schulz, TEX 260780, 260785.  
*Astragalus emoryanus* (Rydb.) Cory, TEX 260780, 260785.  
*\*Astragalus greggii* S. Watson, G.H. 24374, TEX 260841.  
*\*Astragalus mario-sousae* E. Estrada, Villarreal & Yen, E.E. 12729.  
*\*Astragalus regiomontanus* Barneby, E.E. 15433, 15444; TEX 260536.  
*Astragalus sanguineus* Rydb., G.H. 24375.  
*Bauhinia macranthera* Benth., E.E. 13319, 14867, 16105, 16798, 18878, 19169; G.H. 24230, 25915; J.V. 7129.  
*Caesalpinia mexicana* A. Gray, E.E. 13316, 13370; G.H. 22183.  
*Calia secundiflora* (Ortega) Yakovlev, E.E. 15197, 19168, 19512; G.H. 24981; TEX 273983, 274012, 274013, 274017.  
*Calliandra conferta* Benth., E.E. 15214; TEX 153899.  
*Canavalia septentrionalis* J.D. Sauer, E.E. 16275, 16558; TEX 229792, 229793, 229807, 229810.  
*Canavalia villosa* Benth., E.E. 13353, 14642, 14683, 14837, 14874, 15207, 16350, 16748; J.V. 8583, 8680, 8691; TEX 213923, 229880.  
*Centrosema sagittatum* Brandegees, E.E. 16224.  
*Centrosema virginianum* (L.) Benth., E.E. 13384, 14833, 14846, 14849, 15215, 16221, 16271; G.H. 24218; TEX 223079, 229987.  
*Cercis canadensis* L. var. *mexicana* (Rose) M. Hopkins, G.H. 25951; E.E. 19301.  
*Chamaecrista nictitans* L. ssp. *disadena* Irwin & Barneby, E.E. 13362, 16237.  
*Chamaecrista greggii* Pollard var. *greggii*, E.E. 14896, 15213.  
*Clitoria mexicana* Link, E.E. 15450; LL 220049.  
*Cologania angustifolia* Kunth, E.E. 15438; G.H. 25609.  
*Cologania broussonetii* DC., E.E. 14671, 16744, 18909, 18923, 19183, 19364.  
*Coursetia caribaea* (Jacq.) Lavin var. *caribaea* (Jacq.) Lavin, TEX 220126.  
*Coursetia glabella* (A. Gray) Lavin, E.E. 16851.  
*Crotalaria incana* L., E.E. 13311, 14857.  
*Crotalaria polyphylla* Riley, E.E. 16523, 16625.  
*Crotalaria pumila* Raf., E.E. 16752, 16861, TEX 253138, 253211.  
*Crotalaria rotundifolia* (Walter) J.F. Gmel. var. *vulgaris* Windler, E.E. 16485.  
*Crotalaria sagittalis* L., TEX 253289.  
*Dalea bicolor* Humb. & Bonpl. In Willd. var. *bicolor* Humb. & Bonpl. In Willd., E.E. 16146, 16847, 16860.  
*Dalea greggii* A. Gray, E.E. 13324.  
*Dalea hospes* (Rose) Bullock, E.E. 14860, 14892, 15208, 18887, 18920; J.V. 8690, TEX 247898, 247899, 247902.  
*Dalea longipila* (Rydb.) Cory, TEX 214042.  
*Dalea lutea* Willd. var. *lutea* Willd., E.E. 15206, 18922; TEX 214113.  
*Dalea nana* Torr. ex A. Gray var. *carlescens* (Rydb.) Kearney & Peebles, E.E. 15146.  
*Dalea pogonathera* A. Gray var. *walkerae* (Tharp & F.A. Barkley) B.L. Turner, E.E. 15145; TEX 214388.  
*Dalea saffordii* (Rose) Bullock, J.V. 7127.  
*Dalea scandens* (Mill.) R.T. Clausen, E.E. 14706, 14863, 19119.  
*Dalea scandens* (Mill.) R.T. Clausen var. *paucifolia* (Coul.) Barneby, E.E. 16223; LL 214464; TEX 214470.  
*Dalea wrightii* A. Gray, E.E. 19491.  
*\*Desmanthus pringlei* (Britton & Rose) F.J. Hermann, E.E. 14632; G.H. 24225; TEX 257182.  
*Desmodium angustifolium* DC., E.E. 14627, 14699, 14875a.  
*Desmodium caripense* G. Don, E.E. 16631, 19089, 19140; TEX 221779.  
*Desmodium glutinosum* (Muhl. ex Willd.) Wood, E.E. 16367a, 16525, 16639, 18891; LL 221817.  
*Desmodium grahami* A. Gray, E.E. 16228, 16486, 16534, 16855, 18901, 19008, 19181; G.H. 25463.  
*Desmodium lindheimeri* Vail, E.E. 16749, 18883, 18899; J.V. 8689; TEX 221953, 221956, 221961, 221964, 221967.  
*Desmodium macrostachyum* Hemsl., E.E. 16656; TEX 221190.  
*Desmodium molliculum* (Kunth) D. C., E.E. 15442, 16367; TEX 221213.  
*Desmodium procumbens* (Mill.) Hitchc, LL 221362.  
*Desmodium psilophyllum* Schlecht., E.E. 14834, 16264, 16490, 16527, 18926, 19113; G.H. 24228; J.V. 8688; LL 221423, 221430; TEX 221424, 221434, 221435, 221437, 221443, 221444, 221445.  
*Desmodium retinens* Schlecht., E.E. 14701, 15449, 16267, 16403, 16484, 19114, 19215.  
*Ebenopsis ebano* (Berland.) Barneby & J.W. Grimes, E.E. 16231.  
*Eysenhardtia texana* Scheele, E.E. 13325, 14889, 16404; G.H. 24398.  
*Galactia brachystachya* Benth. E.E. 19504.  
*Galactia striata* Urb., E.E. 16272.  
*Galactia texana* A. Gray, E.E. 14865; TEX 220858.  
*Havardia pallens* Britton & Rose, E.E. 14645, 14851, 14861, 18896; G.H. 24451, 24979, 24980; TEX 252138, 252140, 257337.  
*Hoffmanseggia glauca* (Ortega) Eifert, E.E. 14685.  
*Indigofera acutifolia* Schltdl., TEX 220548.  
*Indigofera hartwegii* Rydb., E.E. 15209.



*Indigofera miniata* Ortega var. *leptosepala* (Nutt.) B.L. Turner, E.E. 14630, 16434, 16837.  
*Indigofera miniata* Ortega var. *miniata* Ortega, E.E. 14881, 16276, 18908; LL 220671.  
*Indigofera suffruticosa* Mill., E.E. 13330, 14888, 14894, 15211, 16681.  
*Lathyrus longipes* White, E.E. 15398, 15408, 15982; J.V. 7134.  
*Lathyrus parvifolius* S. Watson, E.E. 15397, 15410, 15410, 15456, 19578; J.V. 7133.  
*Lespedeza virginica* (L.) Britton, LL 103958.  
*Leucaena greggii* S. Watson, E.E. 16104, 19264; G.H. 24967; J.V. 7130; TEX 257620.  
*Leucaena pulverulenta* Benth., E.E. 13382, 14862, 16049, 16756a, 18915; LL 257732; TEX 257733, 257737.  
*\*Lupinus caballoanus* B.L. Turner, E.E. 14682, 15400, 15401, 15419, 15427, 15973, 16601, 19601; TEX 180565, 180567, 180567, 180569, 371344.  
*Lupinus muelleri* Standl., J.V. 7124.  
*Lupinus potosinus* Rose, TEX 180883.  
*Lupinus texensis* Hook., E.E. 13326; TEX 180939, 180948, 180960.  
*Macroptilium gibbosifolium* (Ortega) A. Delgado, G.H. 24355.  
*Marina scopa* Barneby, TEX 272453.  
*Medicago lupulina* L., E.E. 14871, 15458, 16045, 16418, 16467, 16636.  
*Medicago polymorpha* L., E.E. 16085; J.V. 7126.  
*Medicago sativa* L., E.E. 19216.  
*Melilotus albus* Medik., E.E. 18971, 18982.  
*Melilotus indicus* (L.) All., E.E. 16069, 16086.  
*Mimosa malacophylla* A. Gray, E.E. 19388; G.H. 24108; TEX 230417.  
*Mimosa quadrivalvis* L. var. *latidens* (Small) Barneby, E.E. 15216.  
*Mimosa texana* (A. Gray) Small var. *texana* (A. Gray) Small, E.E. 15212, 16393, 16661, 19325.  
*Mimosa zygophylla* Benth., TEX 230703.  
*Nissolia platycalyx* S. Watson, TEX 272737.  
*Nissolia platycarpa* Benth., TEX 272753.  
*Orbexilum melanocarpum* (Benth.) Rydb., E.E. 15446.  
*Orbexilum oliganthum* G. Nesom, LL 272877; TEX 272879.  
*Oxyrhynchus* sp. TEX 272902.  
*Painteria elachistophylla* (S. Watson) Britton & Rose, E.E. 13329, 13340, 15147.  
*Pediomelum rhombifolium* (Torr. & A. Gray) Rydb., E.E. 16226, 16489, 16536, 18914, 18992.  
*Phaseolus albiflorus* Freytag & Debouck, E.E. 16630, 16642, 16769, 16786, 18927, 19028.  
*Phaseolus glabellus* Piper, TEX 273159.  
*Phaseolus leptostachyus* Benth. var. *leptostachyus* Benth., E.E. 18881, 16657; TEX 273162.  
*Phaseolus maculatus* Scheele ssp. *ritensis* (M.E. Jones) Freytag, E.E. 16842.  
*Phaseolus neglectus* F.J. Hermann, J.V. 8687.  
*Phaseolus scabrellus* Benth. ex S. Watson, E.E. 14675, 14845, 14847.  
*Phaseolus vulgaris* L., E.E. 19187.  
*Pisum sativum* L., E.E. 16068.  
*Prosopis glandulosa* Torr. var. *glandulosa* Torr., E.E. 12746; G.H. 24970; TEX 96282.  
*Prosopis glandulosa* Torr. var. *torreyana* (L.D. Benson) Johnst, E.E. 13337, 16709.  
*Prosopis laevigata* (Humb. & Bombp. ex Willd.) M.C. Johnst, E.E. 13332.  
*Rhynchosia difformis* (Elliott) DC., E.E. 13372.  
*Rhynchosia longeracemosa* Mart. & Galeotti, E.E. 18892.  
*Rhynchosia minima* (L.) DC., E.E. 14848, 14850, 16236.  
*Rhynchosia senna* Gillis ex Hook. & Arn. var. *angustifolia* (A. Gray) Grear, G.H. 25484.  
*Robinia pseudo-acacia* L., J.V. 7125.

*Securigera varia* (L.) Lassen, E.E. 14666, 16126, 16176; G.H. 24138; J.V. 7128; TEX 220080, 255415.  
*Senna lindheimerana* Scheele, E.E. 13385, 14704, 14859, 15210, 16560, 19109, 19273; G.H. 22189.  
*Senna occidentalis* (L.) Link, E.E. 19405.  
*Trifolium amabile* Kunth, J.V. 7131.  
*Trifolium amabile* Kunth var. *hemsleyi* (Lojac.) D. Heller & Zohary, E.E. 14665.  
*Trifolium repens* L., E.E. 15975, 15986.  
*Vicia americana* Muhl. ex Willd. ssp. *americana*, E.E. 16382.  
*Vicia humilis* H.B.K., E.E. 15983, 16001, 16470, 16540; J.V. 7132.  
*Vicia pulchella* Kunth, TEX 274306.  
*Vicia villosa* Roth, E.E. 16087.  
*Vigna populnea* Piper, E.E. 16560a, 16654, 19152, 19164.  
*Zapoteca media* (M. Martens & Galeotti) H. Hernández, E.E. 13380.

### Fagaceae

*Quercus acutifolia* Née var. *conspersa* (Benth.) A. DC., LL 169142.  
*Quercus affinis* M. Martens & Galeotti, E.E. 15463, 16336, 16377.  
*Quercus canbyi* Trel., E.E. 12719, 13334, 14705, 14890, 18894, 19132, 19170, 19211, 19472; G.H. 25924, 25939; J.V. 8704; TEX 171884.  
*Quercus coccolobaefolia* Trel., E.E. 15416, 15432, 15445, 16375, 16482, 16535.  
*Quercus conspersa* Benth., TEX 169142.  
*Quercus fusiformis* Small, TEX 169498.  
*Quercus greggii* (A. DC.) Trel., E.E. 16380, 19557; G.H. 17828; TEX 169683, 169702.  
*Quercus hintoniorum* Nixon & C.A. Mull., E.E. 12726.  
*Quercus intricata* Trel., G.H. 25923; J.V. 7114.  
*Quercus laceyi* Small, E.E. 13312, 18885; G.H. 25922; TEX 169970, 235375.  
*Quercus laeta* Liebm., E.E. 15441, 15443, 16283, 16381, 16499, 16532, 19014; G.H. 24436, 24940; J.V. 8566; TEX 241052, 241053.  
*Quercus laurina* Bonpl., E.E. 15459.  
*Quercus mexicana* Humb. & Bonpl., E.E. 16303, 19013.  
*Quercus pinnativenulosa* C.H. Mull., E.E. 15417, 15435; TEX 370427.  
*Quercus polymorpha* Schltdl. & Cham., E.E. 13371, 16212, 16213, 18943, 19311, 19321; G.H. 24166, 24983; J.V. 8703; LL 241700, 241701; TEX 235413, 235414, 235418, 241674, 241746.  
*Quercus pringlei* Seem., TEX 241782.  
*Quercus rysophylla* Weath., E.E. 13309, 15420, 16553; G.H. 24101; TEX 235077, 235081, 235083, 255307.  
*Quercus saltillensis* Trel., G.H. 24934; TEX 235112.  
*Quercus sartorii x mexicana* Liem., E.E. 16132, 19029.  
*Quercus sideroxyla* Humb. & Bonpl., TEX 235217.  
*Quercus striatula* Trel., E.E. 12718, 12721, 19015.  
*Quercus trinidadensis* C.H. Muller, LL 370440, 370443.  
*Quercus tuberculata* Liebm., E.E. 19465; TEX 235462.  
*Quercus virginiana* Mill. var. *fusiformis* (Small) E. Murray, TEX 169498.

### Flacourtiaceae

*Neopringlea integrifolia* (Hemsl.) S. Watson, E.E. 19349; G.H. 24975; TEX 157139, 157150.  
*Xylosma flexuosum* Hemsl., E.E. 19462; J.V. 8686; LL 157358; TEX 157341, 157342, 157360.

### Fouquieriaceae

*Fouquieria splendens* Engelm., E.E. 19479.

### Garryaceae

*Garrya glaberrima* Wangerin, E.E. 15461, 16341; LL 163795; TEX 163793.  
*Garrya laurifolia* Harte. ex Benth. var. *macrophylla* (Benth.) Dahling, E.E. 16305; TEX 163868, 163868.  
*Garrya ovata* Benth. var. *mexicana* Dahling, E.E. 12724; J.V. 8670; TEX 154026.  
*Garrya wrightii* Torr., E.E. 19585.



**Gentianaceae**

- Centaurium arizonicum* (A. Gray) A. Heller, TEX 251231.  
*Eustoma exaltatum* (L.) Salisb., G.H. 17830, 18273; TEX 251338.

**Geraniaceae**

- Erodium cicutarium* (L.) L'Hér., E.E. 19559.  
*Geranium seemanni* Peyr., E.E. 11308, 14635, 14638a, 16056, 16388, 16448, 16617, 16784, 18912, 18916, 19159; LL 154864; TEX 154862, 154873, 154876.  
*Pelargonium odoratissimum* L'Hér., E.E. 16604, 19402.

**Hydrangeaceae**

- Fendlera linearis* Rehder, E.E. 18940.  
*Fendlerella lasiopetala* Standl., TEX 168856.  
*Philadelphus calcicola* S.Y. Hu., TEX 154354.  
*Philadelphus madrensis* Hemsl., E.E. 16112, 18954; TEX 255010.  
*Philadelphus pringlei* S.Y. Hu., TEX 154357, 154358.

**Hydrophyllaceae**

- Nama biflorum* Choisy, G.H. 24119, 24420, 25471; LL 248069, 248070, 248072; TEX 248066, 248068, 248071, 248074, 248078, 248085, 248091, 248093, 248094, 248096, 248098.  
 \**Nama hintoniorum* G.L. Nesom, TEX 248263.  
*Nama hispidum* A. Gray, LL 248354; TEX 248346, 248347, 248352.  
*Nama hispidum* A. Gray var. *spathulatum* C.L. Hitchc., E.E. 16063.  
*Nama palmeri* A. Gray, E.E. 18944; G.H. 24349; J.V. 7108.  
*Nama stenophyllum* A. Gray ex Hemsl., TEX 248604.  
*Nama undulatum* Kunth, E.E. 13360; G.H. 24215.  
*Phacelia congesta* Hook., E.E. 16324; LL 248687.  
*Phacelia rupestris* Greene, LL 248995; TEX 248973, 248998.

**Juglandaceae**

- Carya illinoensis* (Wangenh.) K. Koch, E.E. 16361.  
*Carya myristicaeformis* Nutt., E.E. 16182; J.V. 8672; TEX 171327, 171331.  
*Carya ovata* Britton & Stern et Pogg. var. *mexicana* (Engelm. ex Hemsl.) W.E. Manning, E.E. 16531; J.V. 8565; TEX 213882.  
*Carya ovata* Britton & Stern et Pogg. var. *ovata*, TEX 171337, 171340, 171341.  
*Carya palmeri* W.E. Manning, J.V. 8592; LL 171364; TEX 171366, 171368, 171371, 245904.  
*Juglans major* (Torr.) A. Heller, E.E. 16471.  
*Juglans mollis* Engelm., E.E. 19024; G.H. 24963; TEX 171435, 171436, 171438.

**Krameriaceae**

- Krameria cytisoides* Cav., LL 215985.

**Lamiaceae**

- Agastache palmeri* (B.L. Rob.) var. *leonensis* R.W. Sanders, TEX 164118.  
*Hedeoma costata* A. Gray var. *costata*, E.E. 15958, 16055, 16284, 16462, 16477; G.H. 24134, 24423; J.V. 8571; LL 164771, 164783; TEX 164768, 164769, 164770, 164772, 164773, 164785.  
*Hedeoma costata* A. Gray var. *pulchella* (Greene) R.S. Irving, J.V. 7102.  
*Hedeoma drummondii* Benth., E.E. 16217, 19615; LL 164366; TEX 164353, 164364, 164821.  
*Hedeoma irvingii* B.L. Turner, TEX 164833.  
*Hedeoma nana* (Torr.) Briq. var. *nana*, E.E. 15955.  
*Hedeoma palmeri* Hemsl. var. *santiagoana* B.L. Turner, E.E. 16500, 16526, 16755; TEX 164868, 164872.  
*Hedeoma plicata* Torr., E.E. 11322; TEX 164879.  
*Hyptis mutabilis* (A.T. Richardson) Briq., TEX 164685.  
*Leonotis nepetaefolia* R. Br., TEX 165120.  
*Majorana hortensis* Moench, E.E. 16608.  
*Marrubium vulgare* L., E.E. 16016, 16094, 16366, 16616.  
*Mentha piperita* L., E.E. 16092.  
*Mentha rotundifolia* (L.) Huds., E.E. 16073, 16160.  
*Mentha spicata* L., E.E. 16153.

- Micromeria brownei* (Sw.) Benth., TEX 165311.  
*Monarda citriodora* Cerv. ex Lag. var. *citriodora*, E.E. 16433, 16152.  
*Monarda pringlei* Fern., G.H. 24110, 24336.  
*Poliomintha longiflora* A. Gray, TEX 165506.  
*Physostegia correllii* (Lundell) Shinnars, TEX 165439.  
*Prunella vulgaris* L., E.E. 14636, 15989, 16345, 16466; LL 165533; TEX 165543, 165569.  
*Rosmarinus officinalis* L., E.E. 16359.  
*Salvia ballotiflora* Benth., TEX 244401, 244416.  
*Salvia caudata* Epling, TEX 249467, 249471.  
*Salvia coahuilensis* Fernald, E.E. 18906, 19161, TEX 234613, 234615.  
*Salvia coccinea* Murray, E.E. 13301, 14649, 16059, 19084, TEX 234203, 234215, 234220, 234227.  
*Salvia compsostachys* Epling, TEX 234473, 234477.  
*Salvia coulteri* Epl., E.E. 18918; G.H. 25942.  
*Salvia forreri* Greene, LL 244843.  
*Salvia greggii* A. Gray, E.E. 16603, 19162; G.H. 25933; TEX 234758, 249852, 249855.  
*Salvia hispanica* L., E.E. 16742, 18929.  
*Salvia involucrata* Cav., TEX 229236.  
*Salvia jaimehintoniana* Ramamoorthy ex B.L. Turner, TEX 234960.  
*Salvia reflexa* Hornem., LL 234096.  
*Salvia regla* Cav., LL 229007; TEX 229001, 229004.  
*Salvia roemeriana* Scheele, G.H. 24366, 25941; TEX 223924, 223926, 223968, 223975, 229528, 229529.  
*Salvia serotina* L., LL 234017; TEX 234016.  
*Salvia sharpii* Epling & Mathias, TEX 249774.  
 \**Salvia texana* (Scheele) Torr., TEX 229539.  
*Salvia urolepis* Fernald, G.H. 25904, 25943, 24954; LL 249386; TEX 249382.  
*Scutellaria drummondii* Benth., E.E. 16261.  
 \**Scutellaria monterreyana* B.L. Turner, E.E. 14831; G.H. 24123, 24220, 24419, 25931; LL 165792; TEX 165780, 165784, 165786, 165790, 165791.  
*Scutellaria muzquiziana* B.L. Turner, E.E. 14658.  
*Scutellaria potosina* Brandegees var. *novoleonensis* B.L. Turner, G.H. 24356, 25935; TEX 165836.  
*Scutellaria potosina* Brandegees var. *potosina*, E.E. 13389.  
*Scutellaria seleriana* Loes, TEX 165882, 165884, 165886.  
*Scutellaria suffrutescens* S. Watson, E.E. 16279, 16340; LL 165930; TEX 165916, 165917, 165923, 165924, 165925, 165926, 165928.  
*Stachys agraria* Cham. & Schltdl., G.H. 24111, 24345; TEX 165971.  
*Stachys bigelovii* A. Gray, G.H. 25913.  
*Stachys crenata* Phil., E.E. 16294, 15966.  
*Stachys grahami* Benth., G.H. 24399.  
 \**Stachys vulnerabilis* Rzed. & Calderón, TEX 250846.  
*Teucrium canadense* L., G.H. 17826.  
*Teucrium cubense* Jacq. ssp. *cubense*, E.E. 16071, 16797, 19398; G.H. 24130, 24434, 25899; TEX 250890, 250891, 250927.  
*Teucrium cubense* Jacq. var. *laevigatum* (Vahl) E.M. McClint. & Epling, TEX 250969.

**Lauraceae**

- Litsea glauscecens* Kunth, E.E. 19441.  
*Litsea muelleri* Rehder, TEX 146537.  
*Litsea parvifolia* Mez, E.E. 12737, 16077, 16374, 16621; J.V. 8663.  
*Litsea pringlei* Bartlett, E.E. 16277.  
*Persea americana* Mill., TEX 146963.  
*Persea americana* Mill. var. *drymifolia* (Schltdl. & Cham.) S.F. Blake, TEX 147001.  
*Persea longipes* Meisn., E.E. 16789.

**Lentibulariaceae**

- Pinguicula cyclosecta* Casper, TEX 105638.



**Linaceae**

*Linum lasiocarpum* Rose, E.E. 16139, 16368; G.H. 24232, 24409; TEX 254559, 254567.

\**Linum modestum* C.M. Rogers, TEX 254656.

*Linum nelsoni* Rose, E.E. 14708; TEX 254667, 254668, 254671.

*Linum schiedeanum* Schltdl. & Cham., G.H. 25946; TEX 254817, 254895.

**Loasaceae**

*Cevallia sinuata* Lag., E.E. 16687; TEX 181015.

*Eucnide bartonioides* Zucc., TEX 181065.

*Eucnide lobata* (Hook.) A. Gray, E.E. 16694; G.H. 17821, 22157, 24418; J.V. 7120, TEX 181122, 181150, 181160.

*Eucnide xylinea* C.H. Müll., G.H. 24145, 24365; TEX 181199.

*Mentzelia hispida* Willd., G.H. 25901; TEX 181322, 212118.

*Mentzelia incisa* Urb. & Gilg, E.E. 14856.

*Mentzelia lindheimeri* Urb. & Gilg, TEX 188582.

**Loganiaceae**

*Buddleja cordata* Kunth var. *tomentella* (Standl.) E.M. Norman, TEX 265606.

*Cynoctonum mitreola* (L.) Britton, E.E. 16567.

**Lythraceae**

*Cuphea aequipetala* Cav., E.E. 16334, 16504, 16542.

*Cuphea cyanea* DC., LL 271750; TEX 271739, 271740, 271754, 271769.

*Cuphea lanceolata* Aiton, TEX 271980.

*Heimia salicifolia* Link & Otto., E.E. 16103, 16710, 16766, 18877, 19387; LL 270422, 270425; TEX 270379, 270465, 270469, 270471.

*Lythrum californicum* Torr. & A. Gray, E.E. 14638, 16145, 16602.

**Magnoliaceae**

*Magnolia dealbata* Zucc., E.E. 15434.

**Malpighiaceae**

*Callaeum septentrionale* (Juss) D.M. Johnson, G.H. 22187; LL 275168; TEX 275186, 275192, 275193, 275214, 275215.

*Malpighia glabra* L., TEX 275540.

*Mascagnia lilacina* (S. Watson) Nied., E.E. 18962; G.H. 25954; TEX 275598, 275599.

*Mascagnia macroptera* (DC.) Nied., E.E. 16201, 16761, 16791.

**Malvaceae**

*Abutilon fruticosum* Guill. & Perr., TEX 140352.

*Abutilon hypoleucum* A. Gray, E.E. 13297, 18938, 19314, 19360; J.V. 8573; LL 140457, 140457; TEX 140430, 140431, 140435, 140446, 140470.

*Allowissadula holosericea* (Scheele) D.M. Bates, J.V. 8694.

*Anoda cristata* Schltdl., E.E. 18985; TEX 140919.

*Anoda leonensis* Fryxell, TEX 74054, 74055.

*Batesimalva violacea* (Rose) Fryxell, E.E. 13335, 18928, 18938a, 19158; J.V. 8572, 8693; TEX 74251.

*Callirhoe involucrata* (Torr. & A. Gray) A. Gray var. *tenuissima* Palmer ex Baker, TEX 74320.

*Herissantia crispa* (L.) Brizicky, TEX 74603, 74681.

*Hibiscus acicularis* Standl., E.E. 18889.

*Hibiscus coulteri* Harv. ex A. Gray, E.E. 16172.

*Hibiscus denudatus* Benth., E.E. 16651.

*Hibiscus martianus* Zucc., TEX 74778.

*Malva parviflora* L., E.E. 16013.

*Malvastrum americanum* (L.) Torr., TEX 73359.

*Malvastrum coromandelianum* (L.) Garcke, E.E. 16715; TEX 73424, 73446.

*Melochia pyramidata* L., E.E. 16508; G.H. 24223; TEX 76299.

*Pavonia lasiopetala* Scheele, G.H. 24337; TEX 73780, 73786.

*Sida abutilifolia* Mill., E.E. 16668, 16718.

*Sida elliottii* Torr. & A. Gray var. *parvifolia* Champ., TEX 72401, 72406.

*Sida rhombifolia* L., E.E. 13361, 16222, 16730, 18949; G.H. 24221; TEX 72546, 72551, 72611, 72612.

*Sida spinosa* L., G.H. 24222; TEX 72674.

*Sphaeralcea angustifolia* (Cav.) G. Don, G.H. 24362.

*Sphaeralcea endlichii* Ulbr., LL 72887; TEX 222827.

*Sphaeralcea hastulata* A. Gray, TEX 72922.

*Wissadula amplissima* (L.) R.E. Fries, TEX 77130, 77142.

**Meliaceae**

*Melia azedarach* L., E.E. 19614; TEX 274660.

**Menispermaceae**

*Cocculus carolinus* (L.) DC., J.V. 8700; LL 247122; TEX 247123.

**Moraceae**

*Ficus carica* L., E.E. 16164.

*Morus alba* L., E.E. 16159.

*Morus celtidifolia* Kunth, E.E. 13381; J.V. 7104; LL 216393.

**Myrtaceae**

*Psidium guajava* L., G.H. 24167.

**Nyctaginaceae**

*Acleisanthes longiflora* A. Gray, E.E. 16674.

*Acleisanthes obtusa* (Choisy) Standl., TEX 191822.

*Allionia choisyi* Standl., E.E. 16700.

*Allionia incarnata* L. var. *incarnata* L., TEX 95072, 95078.

*Boerhavia coccinea* Mill., E.E. 16219, 18933; G.H. 24988.

*Cyphomeris crassifolia* (Standl.) Standl., G.H. 25912; TEX 95239.

*Mirabilis albida* Heimerl, E.E. 16401, G.H. 25447.

*Mirabilis glabrifolia* (Ortega) I.M. Johnst., G.H. 24403, 25949; LL 95371; TEX 95365.

*Mirabilis jalapa* L., E.E. 16199, 16614, 16736.

*Mirabilis longiflora* L. var. *wrightiana* (A. Gray ex Britton & Kearney) Kearney & Peebles, TEX 95580, 95581.

\**Mirabilis nesomii* B.L. Turner, G.H. 25567.

*Mirabilis oxybaphoides* (A. Gray) A. Gray in Emory, G.H. 25572.

*Mirabilis polonii* Le Duc., TEX 253429.

*Nyctaginia capitata* Choisy, LL 95721.

**Oleaceae**

*Forestiera reticulata* Torr., LL 156714, 156715, 156716; TEX 156707.

*Fraxinus cuspidata* Torr., E.E. 16003, 16424, 19480; G.H. 24370, 24964, 24977; LL 156807; TEX 245903.

*Fraxinus greggii* A. Gray, E.E. 19427; TEX 156877.

*Menodora longiflora* A. Gray, TEX 265397.

*Osmanthus americana* (L.) Benth. & Hook. f. ex A. Gray, J.V. 7123.

**Onagraceae**

*Calylophus hartwegii* (Benth.) P.H. Raven var. *hartwegii*, G.H. 25459.

*Gaura calcicola* P.H. Raven & D.P. Greg., E.E. 16419, 16835, 18981; TEX 160643, 160729.

*Gaura coccinea* Puesh, E.E. 14657, G.H. 24395, 25916.

*Lopezia nuevo-leonis* Plitmann, P.H. Raven & Breedlove, E.E. 18947.

*Lopezia racemosa* Cav., J.V. 8594; TEX 160988, 160991.

*Oenothera jamesii* (Torr.) A. Gray, E.E. 16649, 16836; LL 161349.

*Oenothera kunthiana* (Spach) Munz, E.E. 13310, 16088; TEX 161380, 161386.

*Oenothera rosea* L'Hér., ex Aiton, E.E. 15962, 16295, 16442, 16461; LL 161521, 161527; TEX 161528, 161532, 161535, 161542, 257732.

*Oenothera speciosa* Nutt., E.E. 16628; G.H. 24361.

*Oenothera tetraptera* Cav., E.E. 16408, 16422; LL 161647; TEX 161660.

**Orobanchaceae**

*Castilleja integrifolia* L. var. *integrifolia* L. F., LL 179487; TEX 179491, 179480.

*Castilleja lanata* A. Gray in Emory, G.H. 25953.

*Castilleja scorzonifolia* Kunth, E.E. 16021; TEX 179827.



*Castilleja tenuiflora* Benth. var. *xylorrhiza* (Eastw.) G.L. Nesom, G.H. 24233, 24472; TEX 87046, 87050, 87058, 87060.

*Conopholis alpina* Liebm. var. *mexicana* (A. Gray ex S. Watson) R.R. Haynes, E.E. 13377; TEX 105180, 105215.

*Pedicularis canadensis* L., TEX 106796.

\**Seymeria deflexa* Eastw., E.E. 19260; G.H. 25930; J.V. 8677; TEX 104066.

*Seymeria virgata* (Kunth) Benth., LL 104143, TEX 104133, 104134.

### Oxalidaceae

*Oxalis berlandieri* Torr., E.E. 14709.

*Oxalis corniculata* L. var. *pilosa* (Nutt.) B.L. Turner, E.E. 14670, 16018, 16332, 16412, 18973; TEX 254119, 254133, 254135, 254138.

*Oxalis drummondii* A. Gray, E.E. 13317, 15972, 15979, 18890, 19239, 19395; LL 254274; TEX 254270, 254288, 254291.

*Oxalis latifolia* Kunth, E.E. 16333, 16443, 19425; TEX 190385.

### Papaveraceae

*Argemone aenea* G.B. Ownbey, E.E. 16415.

*Argemone albiflora* Hornem., G.H. 24974.

*Argemone echinata* G.B. Ownbey, G.H. 17822.

*Argemone grandiflora* Sweet, TEX 147323.

*Argemone mexicana* L. ssp. *mexicana*, TEX 147341, 147344, 147350.

*Bocconia frutescens* L., E.E. 16758; TEX 147497, 147504, 147509, 147511.

*Corydalis pseudomicrantha* Fedde., J.V. 7136.

*Hunnemannia fumariifolia* Sweet, E.E. 12740, 16406, 18991; G.H. 24140; TEX 147620, 147622, 147632, 149624.

### Passifloraceae

*Passiflora affinis* Engelm., TEX 157609, 157612.

*Passiflora foetida* L., TEX 147323.

*Passiflora suberosa* L., J.V. 8692.

### Pedaliaceae

*Proboscidea louisianica* (Mill.) Thell. var. *fragrans* (Lindl.) Bretting, LL 105156.

### Phrymaceae

*Mimulus glabratus* A. Gray, E.E. 16476.

### Phytolaccaceae

*Phytolacca icosandra* L., E.E. 16268; G.H. 24115, 24408.

*Rivina humilis* L., E.E. 18966, 19686; G.H. 24174; LL 258068; TEX 258060, 258063, 258067, 258083, 258089.

### Picramniaceae

*Picramnia polyantha* (Benth.) Planch., E.E. 19634; LL 189458; TEX 200013.

### Piperaceae

*Peperomia berlandieri* Miq., TEX 111917, 111918.

*Peperomia blanda* (Jacq.) Kunth, LL 111966; TEX 111963, 111967, 111968, 111970, 111972, 111973.

*Peperomia campylotropa* A.W. Hill, TEX 111992.

*Peperomia quadrifolia* (L.) Kunth., E.E. 16328, 16516; TEX 255034.

*Piper auritum* Kunth, G.H. 17828b.

### Plantaginaceae

*Bacopa monnieri* (L.) Pennell, E.E. 16246, 19546.

*Maurandya barclaiana* Lindl., E.E. 14866; G.H. 24490; TEX 106449.

*Mecardonia procumbens* (Mill.) Small, LL 106566.

*Penstemon barbatus* (Cav.) Roth, G.H. 24396; TEX 106995, 106996, 107001, 107026.

*Penstemon campanulatus* (Cav.) Willd; LL 107099.

\**Penstemon galloensis* G.L. Nesom, TEX 107192.

*Penstemon lanceolatus* Benth., TEX 107398.

*Plantago australis* Lam., E.E. 14639, 14668, 16110, 16291, 16311.

*Plantago australis* Lam., ssp. *hirtella* (Kunth) Zahn, TEX 89528.

*Plantago hookeriana* Fisch & C.A. Mey, TEX 89623, 89625, 89626.

*Plantago lanceolata* L., E.E. 14681, 16111, 18879, 18886, 19280.

*Plantago major* L., E.E. 16190, 18882.

*Plantago rhodosperma* Decne., TEX 89734.

### Platanaceae

*Platanus mexicana* Moric. var. *mexicana*, TEX 191711.

*Platanus occidentalis* L. var. *glabrata* (Fern.) Sarg., G.H. 22185.

*Platanus rzedowskii* Nixon & J.M. Poole, E.E. 16577; TEX 150225, 150264, 150261, 150262, 150265, 191711.

### Plumbaginaceae

*Plumbago scandens* L., TEX 228400, 228430, 228437.

### Polemoniaceae

*Cobaea pringlei* (House) Standl., E.E. 18948, 19153; TEX 217928, 217929, 217930, 217931, 217932, 217933, 217934, 217935, 217936, 217942, 217943, 29156.

*Gilia acerosa* (A. Gray) Britton, G.H. 25905.

*Gilia incisa* Benth., G.H. 24173, 24422; TEX 192470, 192472, 192595.

*Gilia rigidula* Benth. var. *rigidula*, E.E. 16061.

*Gilia stewartii* I.M. Johnst., E.E. 14623, 14698, 14843.

*Ipomopsis aggregata* (Pursh) V.E. Grant ssp. *formosissima* (Greene) Wherry, G.H. 25581.

*Loeselia coerulea* (Cav.) G. Don, E.E. 16399, 19213, 19275.

*Polemonium pauciflorum* S. Watson, TEX 213204.

### Polygalaceae

*Polygala alba* Nutt., G.H. 24433.

*Polygala glandulosa* Kunth, TEX 222114.

*Polygala lindheimeri* A. Gray var. *eucosma* (S.F. Blake) T. Wendt, G.H. 25457.

*Polygala ovatifolia* A. Gray, TEX 187958, 187962.

*Polygala scoparioides* Chodat, LL 200473.

*Polygala semialata* S. Watson, TEX 187884.

*Polygala viridis* S. Watson, J.V. 1254.

### Polygonaceae

*Eriogonum greggii* Torr. & A. Gray, G.H. 22156.

*Eriogonum jamesii* Benth. var. *undulatum* (Benth.) S. Stokes ex M.E. Jones, E.E. 12728; TEX 109968.

*Polygonum aviculare* L., E.E. 16100.

*Polygonum hydropiperoides* Michx., TEX 172304.

*Polygonum lapathifolium* L., E.E. 16118, 16643, 16745.

*Rumex mexicanus* Meissner, E.E. 16097, 16157, 16242, 16502, 18972.

*Rumex obtusifolius* L., TEX 172569.

*Rumex pulcher* L. var. *eupulcher* Rech., E.E. 14661.

### Portulacaceae

*Portulaca oleracea* L., E.E. 16699.

*Portulaca pilosa* L., G.H. 24432.

*Talinopsis frutescens* A. Gray, TEX 253632.

*Talinum aurantiacum* Engelm., G.H. 24357.

*Talinum paniculatum* (Jacq.) Gaertn., E.E. 16793.

### Primulaceae

*Anagallis arvensis* L., E.E. 15951; J.V. 7111; TEX 228180, 228204.

*Samolus ebracteatus* Kunth var. *cuneatus* (Small) Henr., E.E. 13349; TEX 228277, 228278.

*Samolus parviflorus* Raf., TEX 228333, 228350.

### Ranunculaceae

*Aquilegia chrysantha* A. Gray, E.E. 19602.

*Aquilegia longissima* A. Gray ex S. Watson, TEX 239917, 239942, 239943, 239944.

*Clematis drummondii* Torr. & A. Gray, E.E. 16441, 19679; G.H. 25469; LL 240047; TEX 240049, 240057, 240059.

*Clematis pitcheri* Torr. & A. Gray, E.E. 16006, 19509; J.V. 8584.



*Delphinium madreense* S. Watson, E.E. 13356; G.H. 24217; TEX 240311, 240313, 240319, 240323.

*Ranunculus peruvianus* Pers., E.E. 11808, 16308; LL 240559; TEX 240533, 240535.

*Ranunculus petiolaris* Kunth ex DC., TEX 240613.

*Ranunculus sierrae-orientalis* (L.D. Benson) G.L. Nesom, E.E. 13307, 16070; TEX 240612, 240614, 240615.

*Thalictrum grandifolium* S. Watson, TEX 240765, 240770, 240772, 240773.

### Resedaceae

*Oligomeris linifolia* (Vahl) J.F. Macbr, TEX 149993.

### Rhamaceae

*Ceanothus buxifolius* Willd. ex Kunth, E.E. 19526; LL 264796; TEX 264788.

*Ceanothus coeruleus* Lag., E.E. 12722; G.H. 25950; TEX 264853, 264883, 264890, 264898, 264957, 264980.

*Ceanothus fendleri* A. Gray, E.E. 18995.

*Colubrina greggii* S. Watson var. *greggii*, E.E. 18911, 16048, 19319; G.H. 24097, 24125, 24368; LL 265218; TEX 262004, 262032, 262040, 262044, 265068, 265220, 265222, 265223.

*Condalia hookeri* M.C. Johnst, TEX 263673.

*Condalia viridis* I.M. Johnst., TEX 263733.

*Karwinskia humboltiana* (Roem. & Schult.) Zucc., E.E. 13351, 13368, 16251, 16435, 16701, 19118, 19141; LL 77516; TEX 77536, 77417.

*Rhamnus betulifolia* Greene, E.E. 16348; J.V. 8570, 8701; LL 77810; TEX 77812.

*Rhamnus serrata* Schult., TEX 84588.

### Rosaceae

*Cercocarpus fothergilloides* Kunth, E.E. 12725, 19249; G.H. 24164, 24165.

*Cercocarpus macrophyllus* C.K. Schneid., TEX 150381.

*Cowania plicata* D. Don, E.E. 12733, 16082, 18888.

*Crataegus crus-galli* L., J.V. 7103.

*Crataegus rosei* Egg. var. *rosei*, J.V. 8598; LL 150801; TEX 150801, 150803, 150808.

*Crataegus tracyi* Ashe var. *madrensis* J.B. Phipps, E.E. 16054, 16480.

*Duchesnea indica* (Andr.) Focke, G.H. 24136; TEX 150887.

*Fragaria californica* Cham. & Schltdl., TEX 256033.

*Fragaria virginiana* Mill. var. *ovalis* (Lehm.) R.J. Davis, LL 150947.

*Holodiscus discolor* (Pursh) Maxim., TEX 151028.

*Lindleya mespiloides* Kunth, E.E. 12732; G.H. 24144.

*Malacomeles denticulata* Engl., LL 151223; TEX 151196.

*Malacomeles paniculata* (Rehder) J.B. Phipps, TEX 151277, 151278.

*Physocarpus opulifolius* (L.) Maxim. var. *intermedius* (Rydb.) B.L. Rob., TEX 151335.

*Prunus domestica* L., E.E. 16165.

*Prunus mexicana* S. Watson, E.E. 16615, 19435; LL 189366; TEX 151538.

*Prunus serotina* Ehrh. ssp. *serotina*, TEX 151651, 151652.

*Prunus serotina* Ehrh. ssp. *virens* (Wooton & Standl.) McVaugh, E.E. 16515; TEX 151728.

*Rosa carolina* L., TEX 151939.

*Rosa serrulata* Crép., E.E. 16133, 16599, 19392; J.V. 8561; TEX 151912, 151913.

*Rubus flagellaris* Lefev. & P.J. Muell., G.H. 24135; TEX 152046.

*Rubus humistratus* Steud., E.E. 16050.

*Rubus trivialis* S. Watson, E.E. 16491, TEX 152125, 255413.

*Vauquelinia corymbosa* Humb. & Bonpl., E.E. 19285.

*Vauquelinia corymbosa* Humb. & Bonpl. var. *saltillensis* Hess. & Henr., E.E. 12739, 12747, 16282, 16355; G.H. 25918; TEX 152258, 255011.

### Rubiaceae

*Borreria laevis* (Lam.) Griseb, LL 89877; TEX 89929.

*Bouvardia ternifolia* Standl., E.E. 16256, 18884, 18924, LL 178384; TEX 178369, 178388, 178389, 178390, 178404, 178407, 178409, 178419, 178420.

*Cephalanthus occidentalis* L., E.E. 16572; TEX 178680.

*Chiococca alba* Hitchc., E.E. 19347; J.V. 8674.

*Crusea diversifolia* (Kunth) W.R. Anderson, G.H. 25580.

*Galium microphyllum* A. Gray, TEX 42551, 42552.

*Galium oresbium* Greenm., J.V. 7122.

\**Galium pringlei* Greenm., LL 42586, 42590; TEX 42587, 42588.

*Galium rzedowskii* Dempster, TEX 42609.

*Galium uncinatum* DC., E.E. 14679; G.H. 24128, 24410; J.V. 7121; LL 42724, 42727, 42728; TEX 42687, 42700, 42711, 42712, 42714, 42732.

*Hedyotis intricata* Fosberg, TEX 45429.

*Hedyotis nigricans* (Lam.) Fosberg var. *nigricans*g, E.E. 16147, 16327, 16402, 18988; G.H. 24351, 24373, 25940, 25948; TEX 45319, 45430.

*Hedyotis nigricans* (Lam.) Fosberg var. *gypsophila* B.L. Turner, TEX 45336.

*Hedyotis palmeri* (A. Gray) W.H. Lewis, G.H. 25449.

*Houstonia acerosa* (A. Gray) Benth. & Hook.f. ssp. *acerosa*, TEX 45243.

*Oldenlandia ovata* S. Watson, LL 45698; TEX 45696, 45697.

*Randia laetevirens* Standl., E.E. 16170, 16248; LL 47400; TEX 47375, 47380, 47382, 47387, 47402.

*Randia pringlei* A. Gray, J.V. 7113.

### Rutaceae

*Amyris madrensis* S. Watson, E.E. 19430; LL 235830.

*Amyris marshii* Standl., LL 235818, TEX 235812.

*Casimiroa greggii* (S. Watson) F. Chiang, E.E. 16211, 16216; LL 183738; TEX 183719, 183724, 183725, 183726, 183729, 183730.

*Casimiroa pringlei* S. Watson, E.E. 17346.

*Decatropis bicolor* (Zucc.) Radlk., E.E. 14879, 19324; G.H. 24346; J.V. 8698; LL 183667; TEX 183858, 183866, 183874, 183878, 183884, 183941.

*Esenbeckia berlandieri* Baill., E.E. 16259; TEX 189590, 259366.

*Helietta parvifolia* (A. Gray ex. Hemsl.) Benth., E.E. 16253, 16713, 19300; G.H. 24960, 24966; TEX 189520, 189637, 189640.

*Ptelea trifoliata* L., E.E. 19322, 19493; LL 187450; TEX 187427.

*Ruta graveolens* L., E.E. 16015, 16075, 16609.

*Thamnosma texana* (A. Gray) Torr., E.E. 19490.

*Zanthoxylum fagara* (L.) Sarg., TEX 188705, 259433, 259456.

### Sabiaceae

*Meliosma alba* (Schltdl.) Walp., LL 264625; TEX 264626.

### Salicaceae

*Populus mexicana* Wesm. ex DC., E.E. 19714; TEX 244201, 244209.

*Populus tremuloides* Michx., J.V. 7109; TEX 244224.

*Salix nigra* L., TEX 171172, 171174, 171175.

### Sapindaceae

*Acer negundo* L., E.E. 15998; TEX 231643, 231644, 231645.

*Cardiospermum halicacabum* L., J.V. 8685, TEX 231775.

*Dodonaea viscosa* Jacq., E.E. 13304, 16371, 16731, 19329; TEX 264011, 264047.

*Koeleruteria paniculata* Laxm., J.V. 8675.

*Sapindus saponaria* L., E.E. 16185; TEX 264229, 264257.

*Serjania brachycarpa* A. Gray ex Radlk., E.E. 19354; TEX 264301.

*Serjania incisa* Torr., E.E. 16229.

*Ungnadia speciosa* Endl., E.E. 16735, 16790, TEX 264548, 264567.

*Urvillea ulmacea* Kunth, TEX 264579, 264616.



**Sapotaceae**

*Syderoxylon lanuginosum* (Michx.) Pers., E.E. 19470; G.H. 25911; LL 156065; TEX 156067.

**Saxifragaceae**

*Heuchera mexicana* W. Schaffn., E.E. 16108.  
*Heuchera rubescens* Torr., TEX 168904.

**Scrophulariaceae**

*Buddleja cordata* Kunth ssp. *cordata*, LL 265586; TEX 265584, 265590, 265594.  
*Buddleja cordata* Kunth ssp. *tometella* (Standl.) E.M. Norman, E.E. 16754; G.H. 24392, 24985; J.V. 8669; TEX 265606.  
*Buddleja marrubiifolia* Benth., TEX 265757.  
*Cymbalaria muralis* Gaertn., B. Mey. & Schreb., E.E. 16009.  
*Leucophyllum frutescens* (Berl.) I.M. Johnston, TEX 106029.  
*Leucophyllum langmaniae* Flyr, G.H. 24952, 25903, 25952; LL 106156; TEX 106157.

**Solanaceae**

*Bouchetia erecta* Dunal, G.H. 24400, 25568; TEX 226073, 226080.  
*Capsicum annuum* L. var. *minus* (Dunal) C.B. Heiser & Pickersgill, E.E. 14870, 19429; TEX 226173, 226198.  
*Capsicum baccatum* L., TEX 226211.  
*Capsicum ciliatum* (Kunth) Kuntze, LL 226223; TEX; 226219, 226221, 226234.  
*Cestrum anagryris* Dunal, E.E. 13302.  
*Cestrum oblongifolium* Schltdl., TEX 226383.  
*Datura stramonium* L., E.E. 16776.  
*Hunzikeria texana* (Torr.) D'Arcy, TEX 226796, 226800, 226811, 226801.  
*Jaltomata procumbens* (Cav.) J.L. Gentry, TEX 226906.  
*Lycium berlandieri* Dunal, E.E. 19483.  
*Nicotiana glauca* Graham, E.E. 19272; TEX 227589.  
*Nicotiana nudicaulis* S. Watson., LL 227608.  
*Nicotiana plumbaginifolia* Viv., TEX 227618.  
*Nicotiana trigonophylla* Dunal, E.E. 13354, 18989.  
*Petunia parviflora* Juss., E.E. 16692.  
*Physalis hederifolia* A. Gray, G.H. 25981.  
*Physalis philadelphica* Lam., TEX 219178.  
*Physalis pubescens* L., TEX 219241, 219242.  
*Physalis sordida* Fernald, J.V. 7100.  
*Physalis viscosa* L., E.E. 16747; G.H. 24350; TEX 227800, 227815, 227826, 227834, 227835.  
*Solanum americanum* Mill., E.E. 16794.  
*Solanum douglasii* Dunal, TEX 219821, 219822, 219825, 219828, 219831.  
*Solanum elaeagnifolium* Cav., E.E. 19343.  
*Solanum erianthum* D. Don, E.E. 16234, 19406; G.H. 24226; TEX 219985, 219992, 219993.  
*Solanum rostratum* Dunal, E.E. 16675.  
*Witheringia mexicana* (B.L. Rob.) Hunz., E.E. 13306; G.H. 24227; J.V. 8586, 8681; TEX 107875.

**Staphyleaceae**

*Staphylea pringlei* S. Watson, E.E. 15682; LL 231515, TEX 231511.

**Styracaceae**

*Styrax platanifolius* Engeml. ex Torr. var. *mollis* P.W. Fritsch, TEX 156448.

**Tiliaceae**

*Tilia americana* L. var. *caroliniana* (Mill.) Castigl., E.E. 11811; TEX 86821, 86828; 245905.

**Turneraceae**

*Turnera diffusa* Willd., TEX 157601.

**Ulmaceae**

*Ulmus crassifolia* Nutt., E.E. 16005, 16376.  
*Ulmus serotina* Sarg., TEX 216867, 216867.

**Urticaceae**

*Boehmeria cylindrica* (L.) Sw., E.E. 16568; TEX 112389.  
*Parietaria decoris* N.G. Mill., TEX 112491.

*Parietaria pensylvanica* Muhl. ex Willd. var. *obtusata* (Rydb. ex Small) Shinnars, TEX 112510.

*Pilea microphylla* (L.) Liebm., LL 112650, TEX 112625, 112626, 112641, 112652, 112654.

*Urtica chamaedryoides* Pursh, E.E. 13390.

*Urtica spirealis* Blume, TEX 112933.

**Valerianaceae**

*Valeriana clematidis* Kunth, E.E. 16326, 16633.

*Valeriana scandens* L., TEX 78689.

*Valeriana subincisa* Benth., LL 78794, TEX 78793, 78794, 78796, 78797.

**Verbenaceae**

*Aloysia gratissima* (Gillis & Hook.) Tronc., LL 99090; TEX 99081.

*Aloysia macrostachya* (Torr.) Moldenke, E.E. 19643; TEX 99141, 99173.

*Glandularia bipinnatifida* (Nutt.) Nutt., E.E. 16011; J.V. 7115.

*Glandularia elegans* (Kunth) Umber, E.E. 11296, 13323, 15957, 1596314832; G.H. 24402.

*Glandularia polyantha* Umber, G.H. 24132; TEX 98259, 98262, 98270, 98272, 98279, 98282, 100000.

*Glandularia quadrangulata* (A. Heller) Umber var. *verecunda* (A. Heller) Umber, LL 98321, 98322, 98325; TEX 98305, 98319, 98327.

*Lantana achyranthifolia* Desf., J.V. 8695; LL 98451; TEX 98441, 98445, 98446, 98448, 98449, 98465.

*Lantana camara* L., E.E. 14885, 16708, 19088, 19124; G.H. 24099; J.V. 8696; TEX 98557.

*Lantana canescens* Kunth, TEX 98679, 98688, 98699.

*Lantana hirsuta* M. Martens & Galeotti, TEX 98767.

*Lantana hirsuta* x *camara*, TEX 98779.

*Lantana macropoda* Torr., E.E. 16218, 16250; TEX 98983, 100020.

*Lantana velutina* M. Martens & Galeotti, E.E. 16703; TEX 100195.

*Lippia graveolens* Kunth, TEX 100522.

*Phyla fruticosa* (Mill.) K. Kenn. & Rueda, TEX 100724.

*Phyla incisa* Small, E.E. 14855, 16186, 16673.

*Phyla nodiflora* (L.) Greene, G.H. 17833.

*Phyla strigulosa* (M. Martens & Galeotti) Moldenke, G.H. 22188, 24113, 24414.

*Priva mexicana* Pers., J.V. 8589; TEX 101018, 101021, 101026, 101027.

*Verbena brasiliensis* Vell., G.H. 24171, 24343.

*Verbena canescens* Kunth., E.E. 14622; G.H. 24363; TEX 101289, 101321, 101327.

*Verbena carolina* L., LL 101396, 101397; TEX 101394.

*Verbena cloverae* Moldenke, TEX 101495.

*Verbena litoralis* Kunth, E.E. 16047, 16095.

*Verbena menthaefolia* Benth., E.E. 18987.

*Verbena neomexicana* (A. Gray) Small, E.E. 16420; TEX 200901.

*Verbena officinalis* L., TEX 200276.

*Verbena officinalis* L. ssp. *halei* (Small) S.C. Barber, G.H. 24216, 24412; TEX 101539.

*Verbena runyonii* Moldenke, TEX 200275.

**Veronicaceae**

*Veronica persica* Poir., E.E. 13355, 15970, 16023, 19023.

**Violaceae**

*Viola nuevo-leonensis* Becker, TEX 159757, 159759.



**Viscaceae**

*Arceuthobium vaginatum* (Humb. & Bonpl. ex Willd.) C. Presl., E.E. 16492; J.V. 7112.

*Phoradendron villosum* (Nutt.) Nutt., E.E. 16799.

**Vitaceae**

*Parthenocissus quinquefolia* (L.) Planch., E.E. 16775, 19711; J.V. 8567; LL 263136; TEX 263114, 263138, 263139, 263140.

*Vitis berlandieri* Planch., E.E. 16364, 16533; J.V. 8664.

*Vitis cinerea* Engelm. ex. Millardet, E.E. 16845; G.H. 24141; J.V. 7119; LL 263221; TEX 263204, 263209, 263216, 263217, 263220.

**Zygophyllaceae**

*Guaiaacum angustifolium* Engelm., E.E. 16711.

*Kallstroemia parviflora* Norton, E.E. 16702; G.H. 25461; TEX 259292.

*Larrea tridentata* (Sessé & Moc. ex DC.) Coville, E.E. 19632a.

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